University of Alberta

BUILDING A CORE ENTERPRISE VOCABULARY
THE ONTOLOGY-BASED APPROACH

By:

Vaishali Singh ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Master of Science.

Department of Electrical and Computer Engineering

Edmonton, Alberta

Spring 2007

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Your file Votre référence
ISBN: 978-0-494-30026-8
Our file Notre référence
ISBN: 978-0-494-30026-8

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DEDICATION

I dedicate my dissertation work to the loving memories of my beloved father, for his love and confidence in me that have brought me this far in life and will hopefully carry me further.

ABSTRACT

"BUILDING EFFICIENT ENTERPRISE VOCABULARY: THE ONTOLOGY-BASED APPROACH"

A pivotal element of the next generation of web is semantics. The motivation of this thesis is to find out which Semantic Web technologies are suitable for addressing the unique requirements of business applications.

This thesis addresses an approach that clearly defines and represents a complete Enterprise while taking into consideration aspects such as Organization Structure, Business Concepts and Processes, Manpower, Products etc. We propose to use ontology as a means for representing the information associated with an Enterprise, in a simple way. Besides describing an Enterprise the proposed ontology also incorporates the implementation of the rules, which are built using concepts defined in the ontology. This provides one more dimensionality of enhancement and validation, to the proposed idea. The goal of our research is to construct and make available a generic ontology that can be used to construct an ontology representing an Enterprise of any size and structure. The approach provides us with a standard method for representing business rules and business vocabulary.

ACKNOWLEDGEMENTS

I would like to express my sincere appreciation to my supervisor Dr Marek Reformat, for his constant encouragement and invaluable guidance throughout my research, for his support during my years as a graduate student and most of all the insight he has provided me to excel as a person and a professional.

I would also like to express my gratitude to all my family members for their endless love and support, to my mom whom I am totally indebted to, for her wisdom and endless belief in me, which has been my driving force in life and especially to my husband without whose encouragement I wouldn't have had the confidence and enthusiasm to start and end my graduate studies journey. I also would like to thank to my brothers and my in-laws, who never stop encouraging me.

I extend my thanks to the members of my M.Sc. committee members for their careful review of the thesis and for many useful comments.

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Chapter 1

Introduction

1.1 Introduction

The amount of information available on the World Wide Web is enormous and constantly growing. Accessing and using this information in an efficient way has become a growing challenge. One of the research initiatives to overcome this challenge has been the area of Semantic Web. The main aim of Semantic Web is to reduce the manual discovery and usage of web resources in the form of documents or services, and also to allow intelligent software agents to automatically identify these web resources and to execute them for achieving the desired and user specified goals.

Semantic Web has become a primary focus of research and development in the field of Information Technology. The central idea of Semantic Web is to have a well defined and represented data on the WWW, so that it is available for use by both machines and humans for various purposes. It allows the usage of static as well as dynamic information on the web, resulting in much higher efficiency.

In order to achieve this goal, Semantic Web introduced new concept of semantics based knowledge representation. Another area, that Semantic Web brought into perspective is, ontology. Both these areas are interrelated deeply. It is with the help of these technologies that the idea of machine readable data is being brought into reality.

A lot of research and development is being done to find out how applications, built using the Semantic Web technologies, can meet the real market needs and how the Semantic Web technology, with an ontology driven approach, is suited to support the demanding requirements of the business applications.

Looking at the plethora of work being done in the area of Semantic Web, ontology seems to be the heart of any significant Semantic Web technology solution. Developing ontologies is the first step towards any Semantics based approach. A key feature that would make a semantic technology appropriate is the ability to create and manage a large populated ontology for addressing the any kind of business application requirements. An ontology which is populated with the domain knowledge provides a key tool for semantic based approach in solving problems and tackling issues. Such ontology also deals with issues of complexity, dynamic nature of businesses and the ability to react to changes in information.

Our focus in this research work is development of a domain specific knowledge base using these key technologies.

1.2 Motivation

The motivation of this thesis is the increasing awareness and demand of the Semantic Web technologies. The thesis is an effort to look at what are the technical capabilities and feasibility of a suitable Semantic Web technology i.e. Ontology especially, for addressing unique requirements for business applications. As we will learn about semantics in the next chapter we will realise that a semantic approach is necessary to integrate any kind of heterogeneous information. Semantics relate to the meaning and use of data.

Semantics and ontology engineering can be related in more than one way and also to various fields in a direct or indirect way. These areas of technologies would include, Service Oriented Architecture, Semantic Web Services, Knowledge

Bases, etc. Each of these technologies can be used to make businesses more efficient and responsive to the growing and demanding customer market. They all provide modularisation and machine readable information and so does our approach of creating domain specific ontologies.

For example, SOA is an architectural style that supports service orientation which is a way of integrating a business as a collection of linked services. In this framework, everyday business activities are broken down into individual business functions and processes called services. Businesses have to deal with the concern of constantly changing business rules and the huge collection of processes running within a company. These business process need to comply with different business rules or constraints. In order to assure this, the processes need a formal machine understandable representation of rules. There have been a lot of ways for representing rules. Rules have a long evolution history changing from natural language to a formal specification language like RuleML, etc. Organizations are looking for means to track changes and verify the information from time to time, within a constantly changing business environment.

With the help of ontology engineering, we have tried to create a business-oriented, Enterprise wide ontology which is domain specific and deals with the above issues.

1.3 Contributions

The thesis focuses on the concepts of ontology and semantics, for business systems and Enterprise domain.

We proposed, an architecture which we call, Enterprise Ontology in the Enterprise domain. This Ontology represents a business knowledge which defines the generic and commonly used business related concepts in an Enterprise. It also provides ontological definitions of generally used information at different levels of abstraction.

The ultimate goal of our research is to develop an extensive ontology based on concepts of an Enterprise .We combine semantically described terms that belong to different domains such as Business Processes, Organization Structures, and Business Concepts etc with rules that provide some constraints on the terms and concepts. It is built in a form of a set of shared ontologies, capturing knowledge about a business domain. SWRL is a rule language which helped us to describe business rules in a formal specification that can be executed to validate them. The formal rule specifications enable us to automatically verify if an enterprise concept satisfy the consistency constraints defined by business rules. This enterprise concept can be static like organizational structure ontology concepts or can be dynamic like business processes. This enables us to do formal validation of the concepts defined. This captures central business concepts of an organization in ontologies and business rules in a formal rule language like SWRL.

The Enterprise Ontology has five main components:

1. Organizational Structure ontology
2. Business Concepts ontology
3. Business Process ontology
4. Product ontology
5. User Personalization ontology

Each of these ontologies is an extensive model of the concepts and properties in a particular domain. For example, the Business Process Ontology defines the terms and properties, which will helps, create a framework, for creating a complete business process model. The Organisational Structure Ontology contains important concepts related to basic skeleton of all organisations irrespective of their domain and type. The Product Ontology contains a detailed elaboration on concepts related to PC's, which is our choice of representing a product for the Enterprise Ontology.

These ontology create the definition for the information. To be able to make business knowledge persistent there must be some kind of repository. A repository is by a knowledge base that is created by instantiating these ontologies. Finally, rules were implemented to check the consistency of the knowledge represented.

1.4 Thesis Overview

Chapter 2 of the thesis focus on main concepts, terms, and technologies that are essential for better understanding of the research and work performed in the scope of this thesis. Concepts like Semantic Web, Knowledge Representation and Rules have been explained in detail.

Chapter 3 shows some examples of work done in the area of application of ontology to different domains and also the examples of work done in the area of using rules in Semantic Web have been covered. Research focused on expressing business related concepts using ontology is described in Section 3.1. Issues associated with utilization of rules and benefits that are brought by Semantic Web are described in Section 3.2.

Chapters 4, 5, and 6 contain description of the results of the thesis. They describe the architecture of the proposed Enterprise ontology, its components, and an example of its usage. The proposed Enterprise ontology is presented in Section 4.1. It contains description of its architecture, explanations why such architecture was developed. Brief overviews of its main components are in Section 4.2. Chapter 5 is fully dedicated to individual components of the Enterprise ontology. Section 5.1 describes business concept ontology. Description of business organization is included in Section 5.2. The essential component of the Enterprise ontology – business process ontology – is presented in Section 5.4 and 5.5 respectively.

The Implementation and results are explained in Chapter 6.In Chapter 6 we explain the concept of Business Rules in Section 6.1 and 6.2 and the Experimentation Setup and Results are explained in Section 6.3 and 6.4 respectively. The thesis finishes with Chapter 7. It contains conclusions – Section 7.1.Additionally, the thesis includes Bibliography and Appendix (Enterprise Ontology xml code).

Chapter 2

Background

2.1 Background

In this Section we present the background related to our research. It embraces, the Semantic Web, ontologies and rules.

"The Semantic Web is an extension of the current web in which information is given well-defined meaning, better enabling computers and people to work in cooperation." - Tim Berners-Lee, James Hendler, Ora Lassila.

Much of the information currently online on the World Wide Web is intended for humans.The Semantic Web is based on two main concepts. It is about new and uniform formats for interchange of data, where as on the original WWW, we only have interchange of documents. Also, it is about language for recording how the data relates to real world information, i.e., semantics [8]. Semantics refer to the meaning of the data.

Increasingly the Semantic Web will be called upon to provide access not only to static documents that collect useful information, but also to services that provide useful behavior. The Semantic Web promises to expand the services for the existing web by enabling software agents to automate procedures currently performed manually. The Semantic Web seeks to enrich the current environment, of the World Wide Web, moving it, from a web for human users into a web for software agents capable of providing a powerful assistance to the human users. This will enable users to focus on understanding and decision-making.

The chapter is organized as follows. We introduce the Semantic Web in Section 2.1, Knowledge Representation in Section 2.2, Ontologies in Section 2.3, Language Specifications in Section 2.4, Rule Based Reasoning in Section 2.5, followed by a summary of this chapter in Section

2.2 Semantic Web

A layered architecture for the Semantic Web shown in Figure 2.1, describes the main layers of the Semantic Web design. The development of Semantic Web is envisioned to be a layered approach where each layer is built on top of the other.

The layered architecture, proposed by W3C, intends to enhance the usability and usefulness of the web resources and eventually the whole web. This will be achieved with the help of semantically marked up documents which will be machine readable. The proposed format will be an extension of the current HTML syntax which is used in the web documents on the WWW. An important task will be to create meta data vocabularies- "ontologies", maps between them which will allow the ontology creators to know how to mark up their documents so that software agents can use the information in the supplied meta data [2]. The next task is focused to development of automated software agents to perform tasks for the users of the Semantic Web. Finally due to the focus on services,we would need web services which will have these software agents embedded, and hencewill supply the infromation to these intelligent agents [1].

The approach of dealing with one layer at a time, is justified saying that Semantic Web is still in its developemntal stage, it is easier, to gain consensous on small steps since standardisation is an important issue from the engineering perspective [7].

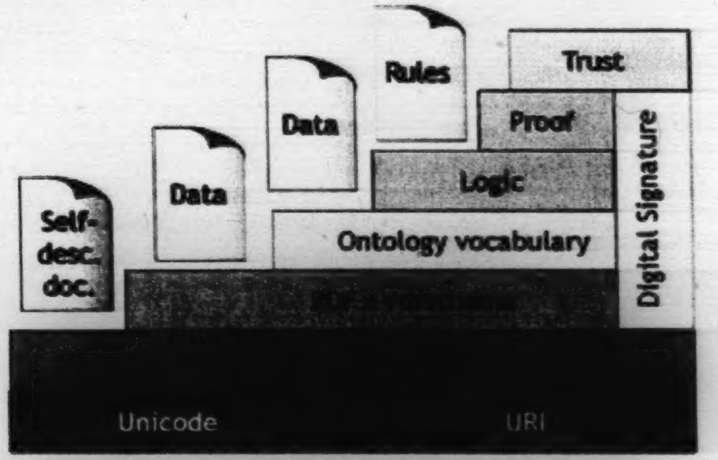


Figure 2.1 Layered Architecture of the Semantic Web

At the bottom of the semantic stack, figure 2.1, we find the *Unicode/URI layer*. Unicode is the character encoding used for full internationalisation. Universal Resource Identifier (URI) is a way of uniquely referring to things so that we can make assertions about these things and integrate such assertions without name conflicts [1].

Then we find the *XML, Namespace, XML Schema layer*. XML is a language that lets us write structured web documents with a user-defined vocabulary. XML is particularly suitable for sending documents across the web. XML schema (see section 2.5.1) is a language for resticiting the structure of XML documents. HTML describes the presentation of data, while XML is about the description of the data. XML Namespaces(NS) allow the construction of different XML vocabularies, and XML schema allows syntax level validation of these vocabularies. The limitation of XML is that using XML only, we cannot specify the meaning of the structure .

Resource Description Framework (RDF) (see section 2.5.2) was developed as a model to express the metadata/meaning of the resources, using XML as the interchange format. In this context a resource can be anything that has identity

[7]. The *RDF layer* is above the XML layer in the W3C semantic stack architecture because RDF is based on an XML-based syntax.

RDF Schema provides modeling primitives for organizing Web objects into hierarchies. Key primitives are classes and properties, subclass and sub property relationships, and domain and range restrictions. RDF Schema is based on RDF.

Then we have the *Ontology layer*. Generally ontology contains a description of important concepts in a domain, crucial properties of each concepts and constraints imposed on them.

Next, the *Logic layer* is used to enhance ontology languages further and to allow us application specific declarative knowledge.

Above the logic layer, are the *Proof* and *Trust* layers. Finally, the *Trust layer* will emerge based on recommendations by trusted agents or on rating and certification agencies and consumer bodies. Trust is an important layer since it relates to sensitive issues like security and authenticity. Digital Signatures, which allows the Semantic Web documents and statements to be digitally signed by authors, provides a basis for the trust layer to decide how much a given document or statement can be trusted [1].

2.3 Knowledge Representation

Knowledge representation is a multidisciplinary subject that applies theories and techniques from three other fields. These fields are:

- *Logic*, which provides the formal structure and rules of inference.
- *Ontology*, which defines the kinds of things that exist in the application domain.
- *Computation*, which supports the applications that distinguish knowledge representation from pure philosophy [37].

A knowledge representation would be vague without logic since logic provides the criteria for determining whether statements are redundant or contradictory. Ontologies provide the terms and symbols which are defined and clear. And the computable models enable the logic and ontology to be implemented in computer programs. Hence knowledge representation is the application of logic and ontology to the task of constructing computable models for some domain.

The Semantic Web community developed standards for describing concepts, encoding document metadata, etc. The standards have developed over the years taking forms of different specifications like RDF, DAML+OIL, and OWL, which is the current representation format. Let's see how knowledge is represented using the most fundamental concept of Semantic Web called Resource Description Framework. RDF is based on sets of three-part declarations (i.e., "triples"): *"Subject, Predicate, and Object"*.

An RDF graph is a set of triples which are *subject*, *predicate*, and *object*. Subjects and predicates are identified by URI values. An Object can be another URI or a value. The subject identifies what object the triple is describing. The *predicate* defines the piece of data in the object a value is given to. The *object* is the actual value.

In other words, RDF defines a simple data model for metadata, i.e., the data model that consist of three objects:

Resources

A resource is anything that can have a URI (Uniform Resource Identifier).

Properties

A property is a specific attribute or relationship that is used to describe a resource. A property of a resource has a value that consists of a description about the resource. A value is either a resource or a literal like a string. A property can be also a resource.

Statement

A resource with a property that has a value consists of a statement. In other words, a statement has a subject (a resource), a predicate (a property), and an object (a value). A statement can be also a resource.

An example of a triple would be:

`<http://www-kasm.nii.ac.jp/~takeda> creator ``Hideaki Takeda''`

This is a statement that means that *http://www-kasm.nii.ac.jp/ takeda* has a property *creator* of which value is *Hideaki Takeda*. The diagrammatical representation of the above example is shown below.

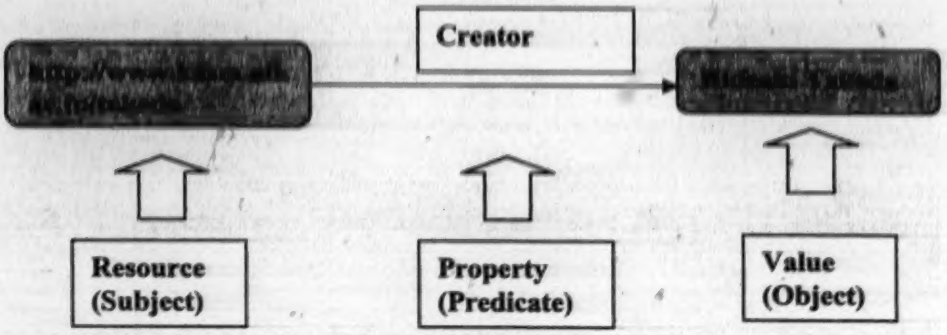


Figure 2.2 A RDF model example

Another significant area in the field of knowledge representation is ontologies. This concept is explained in further detail in the sections below.

2.4 Ontology

2.4.1 Ontology Definition

"Ontology is a term borrowed from philosophy that refers to the science of describing the kinds of entities in the world and how they are related". In philosophy, ontology is the name of a fundamental branch of metaphysics

concerned with existence. According to [10], ontology can be defined as "An explicit specification of conceptualizations". When it was proposed by [11], there was an agreement on the conceptualizations that it had to specify and hence the definition changed to "*Ontology is a formal specification of conceptualizations*."

As stated above, the idea of shared conceptualization is important from the Semantic Web perspective because it enables a common understanding of information. This would mean that there exists a formal specification that represents all the unique and important concepts, and relationships in the domain. Therefore ontologies have become a significant component of Semantic Web. They provide formal models of domain knowledge that can be used by intelligent agents. These ontologies, when shared, will help to exchange data and meaning, between any entities existing on the web.

2.5 Language Specification

There are a number of such languages for ontologies, both proprietary and standards based. In the Semantic Web, ontology is defined using W3C standards of RDF/RDFS and OWL.

2.5.1 XML (eXtensible Markup Language)

XML is a universal meta-language that allows user to define markup for their documents using tags. These tags can be nested to create a structure and the structure of documents can be enforced using schemas. XML Schema on the other hand is a language which restricts the structure of XML documents and also extends the XML data types. It provides a surface syntax for structured documents but does not provide any means of talking about the *semantics* of data [7]. XML supports the exchange of structured information across different applications through markup, structure, and transformations.

2.5.2 RDF/RDFS (Resource Description Framework)

RDF is a simple graph-based data model for referring to objects and how they are related (see figure 2.2). Its key concepts are resource, property, and statement. A statement is a resource-property-value triple. The concept of triples has been explained above as part of knowledge represenation. RDF Schema is a vocabulary for describing properties and classes of RDF resources, with a semantics for generalization-hierarchies of such properties and classes [7].

RDF has an XML-based syntax to support syntactic interoperability. XML and RDF complement each other because RDF supports semantic interoperability to a certain degree. RDF is domain-independent. RDF Schema provides a mechanism for describing specific domains. RDF Schema is a primitive ontology language. Important concepts of RDF Schema are class, subclass relations, property, sub property relations, and domain and range restrictions.

2.5.3 OWL (Web Ontology Language)

The predecessor of OWL-DAML+OIL is a combination of Darpa Agent Markup Language (DAML) and Ontology Inference Layer (OIL). It was used as a semantic mark-up language for Web resources, which made them more accessible to automated processes and more integrated with Web services. It was built on earlier W3C standards such as RDF and RDF Schema, and enhanced these languages with richer modeling primitives.

After DAML+OIL, the Web Ontology Language (OWL) became the official W3C Standard since Feb 2004. It is a web language which is based on RDF(S) and is an ontology language which is based on logic. The first level above RDF required for the Semantic Web was an ontology language that could formally describe the meaning of terminology in web documents. If machines are expected to perform useful reasoning tasks on these documents, the language must go beyond the basics of RDF schema. OWL adds more vocabulary for describing properties and classes, relationships between classes, cardinality, equality, characteristics of properties (e.g. symmetry) and enumerated classes. The basic concepts which are represented using OWL are the following: classes, class-hierarchy, properties / values, relations between classes (inheritance, disjoints, equivalents), restrictions on properties (type, cardinality), characteristics of properties (transitive,), annotations and individuals.

Reasoning tasks like classification and consistency checking can be performed on OWL ontology knowledge base. OWL is intended to be used when the information contained in web resources needs to be processed by applications, as opposed to situations where the content only needs to be presented to humans. OWL can be used explicitly to represent the meaning of terms in vocabularies and the relationship between those terms [5].

Three Types of OWL

OWL provides three increasingly expressive sublanguages designed for use by specific communities of implementers and users [7].

1. ***OWL Full*** is meant for users who want maximum expressiveness and the syntactic freedom of RDF with no computational guarantees.

2. ***OWL DL*** is meant for users who want the maximum expressiveness while retaining computational completeness and decidability. The advantage of this is that it permits efficient reasoning support. The disadvantage is that we lose full compatibility with RDF.

3. ***OWL Lite*** supports those users primarily needing a classification hierarchy and simple constraints. For example, while it supports cardinality constraints, it only supports cardinality values of 0 or 1. OWL Lite has a lower formal complexity than the next stronger sublanguage-OWL DL [5].The advantage of this is a language that is both easier to grasp and easier to implement. However, it has a restricted expressivity.

2.5.3.1 OWL Ontology Description:

As mentioned above, OWL ontology consists of classes, properties and the individuals [38].

- *Classes:*

  Classes are representations of concepts. OWL classes are interpreted generalizations of sets of individuals. They are described using formal descriptions that state precisely the requirement for membership of the class. For example, a class *"Car"* would describe all the individuals that are *Cars* in our domain of interest. Classes may be organized into a super class –subclass hierarchy, which is also known as taxonomy.

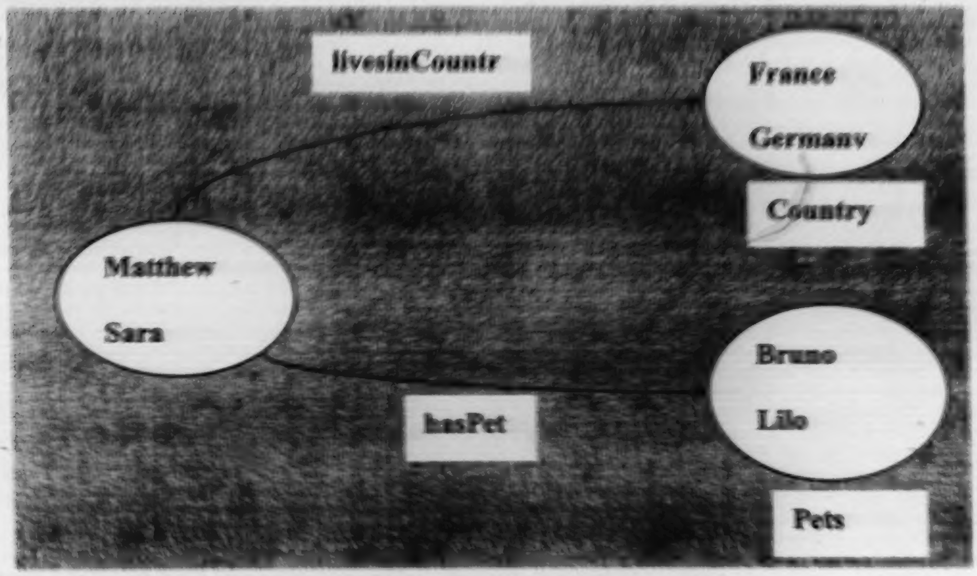


Fig 2.3 Representation of Classes

- **Properties:**

  There are two main types of OWL properties: ***Object properties and Data Type Properties.*** **Object properties** link an individual to another individual. Data type property link an individual to a XML Schema Data type Value or an RDF literal. OWL also has a third type of property called **Annotation Property**. Annotation properties can be used to add information (metadata-data about data) to classes, individuals and object/data type properties.

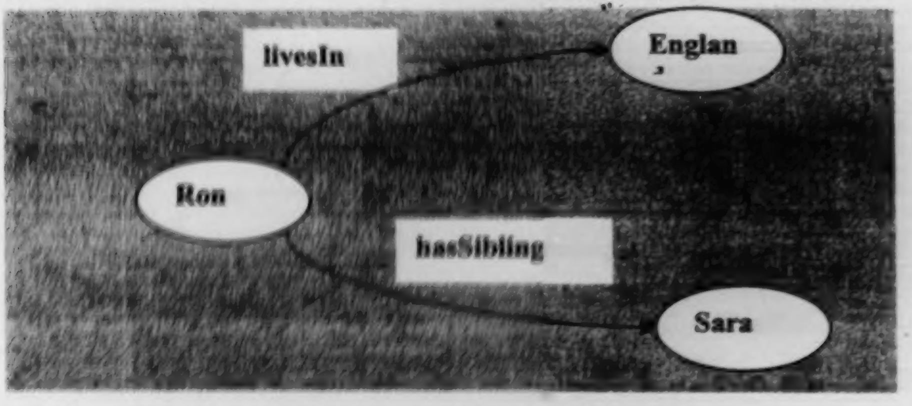


Figure 2.4 Representation of OWL Property

Properties are binary relations on individuals i.e. properties link two individuals together. For e.g. the property hasSibling might link the individual Sara to the individual Ron, or the property has Child might link the individual Kevin to the individual Sara.

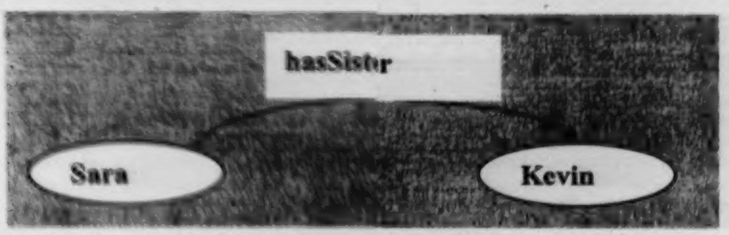


Fig 2.5 Object Property "which links individual Sara to individual Kevin"

In the figure above you can see how the object property "hasSister" relates individual Sara to individual Kevin. Similarly, in figure 2.6 data type property "has Age" links individual Mathew to data literal '25' of type xml: integer"

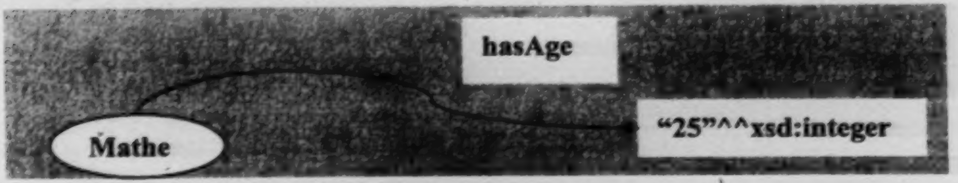


Fig 2.6 Data type property "which links individual Mathew to data literal '25' of type xml: integer"

Properties can also be of the type, annotation. In figure 2.7, annotation property, "dc: creator" links the class "Car" to the data literal (string)"Sara Jones"

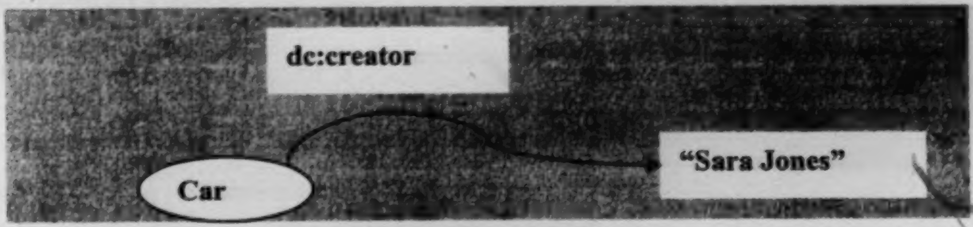


Fig 2.7 Annotation Property linking the class Car to the data literal (string)"Sara Jones"

Properties can have inverse. For e.g. the inverse of hasOwner is isOwnedBy. Properties can be limited to having a single value i.e. to being functional. They can also be transitive or symmetric. These are some basic property characteristics that are represented in OWL.

- **Individuals:**

  Individuals represent objects in the domain that we are interested in. Individuals are also known as instances. Individuals can be referred to as being instances of classes.

2.6 Rules and Rule Based Reasoning in Semantic Web

An important aspect of the Semantic Web are rules. The significance of rule and rule-based representation languages has been often emphasized in the Semantic Web community. In order to add additional expressive features, a rule-layer was added over the ontology layer in the Semantic Web stack [2]. Using rules in conjunction with ontologies is a major challenge for the Semantic Web today.

2.6.1 Rules and Rule based Reasoning

A rule by definition consists of an *antecedent* (or the body) and a *consequent* (or the head), both made up of zero or more atoms. Atoms can refer to the elements of a knowledge base (KB). So, rules specify certain conditions are to derive new facts about the knowledge represented in a knowledge base [4].

Rule based Reasoning is a particular type of reasoning, which uses "if-then-else" rule statements. Rules are simply patterns and an inference engine searches for patterns in the rules that match patterns in the data. The "if" means "when the condition is true," the "then" means "take action A" and the "else" means "when the condition is not true take action B".

2.6.2 SWRL (Semantic Web Rule Language)

OWL does seem to have expressive limitations. The expressive restrictions of OWL were overcome by extending OWL with some kind of "Rule language". Semantic Web Rule Language (SWRL) based on a combination of the OWL DL and OWL Lite sub languages of the OWL Web Ontology Language with the

Unary/Binary Datalog RuleML sub languages of the Rule Markup Language [9]. SWRL includes a high-level abstract syntax for Horn-like rules in both the OWL DL and OWL Lite sub languages of OWL.

2.6.2.1 SWRL Rules

As described in the W3 SWRL specification document [9], rules are the form of an implication between an antecedent (body) and consequent (head).The intended meaning of these rules can be read as –"whenever the conditions specified in the antecedent hold, then the conditions specified in the consequent must hold as well". This is very well explained by the human-readable syntax of the SWRL rules for e.g.

hasParent(?x1,?x2) ^ hasBrother(?x2,?x3) → hasUncle(?x1,?x3)

Both the antecedent (body) and consequent (head) consist of zero or more atoms. Multiple atoms are treated as a conjunction. Atoms in these rules can be of the form C(x), P(x, y), sameAs(x, y) or differentFrom(x, y), where C is an OWL description, P is an OWL property like "hasParent", and x, y are either variables, OWL individuals or OWL data values.

A rule axiom can also be assigned a URI reference, which could serve to identify the rule. The syntax below illustrates the above concepts.

rule::= 'Implies(' [URIreference] { annotation } antecedent consequent ')'

antecedent::= 'Antecedent(' { atom } ')'

consequent::= 'Consequent(' { atom } ')'

Informally, a rule may be read that if the antecedent holds (is "true"), then the consequent must also hold.

2.6.2.2 Interpreting Rules

A simple use of these rules would be to assert that the combination of the hasParent and hasBrother properties implies the hasUncle property. Informally, this rule could be written as:

hasParent(?x1,?x2) ^ hasBrother(?x2,?x3) → hasUncle(?x1,?x3)

In the abstract syntax the rule would be written like:

Implies (Antecedent (hasParent (I-variable(x1) I-variable(x2))
hasBrother (I-variable(x2) I-variable(x3)))
Consequent (hasUncle (I-variable(x1) I-variable(x3))))

To comprehend this rule based on the above explanations of antecedent, consequent, we can say that, from this rule, if John(atom x1) has Mary(atom x2) as a parent and Mary(x2) has Bill(x3) as a brother then John(x1) has Bill(x3) as an uncle.

Hence we see that SWRL rules have a formal syntax and are quite easy comprehensible.

2.7. Chapter Summary

In this chapter we presented the preliminaries of the Semantic Web and the associated technologies. We started with what is the concept of the Semantic Web and what it plans to achieve, followed by the understanding of the layered approach of the Semantic Web Architecture, the languages and the rule paradigm.

Chapter 3

Related Work

3.1 Introduction

To help us better understand what has been done and what areas are left to be explored in the domain of ontologies, business applications, business rules and Semantic Web, we did a study of the following work.

3.2 Ontologies and Business Applications

In the domain of ontologies and business applications, business process automation is playing an increasing role since it helps organizations to improve the efficiency of process execution and cut costs. To help process automation move forward, the system represented by it, and applications must be able to rely on a comprehensive informal base. Along this line, semantically rich business process defined is of paramount importance. *Dieter E. Jenz and Partner* [31] realized that ontology is the perfect foundation for business process automation because business process automation relies heavily on software agents who need to make sense of information in the process execution context. They modeled business process automation in terms of entity type, scope of entities, frequency of change and impact on competitiveness. After studying the model, organizations can be well advised to reuse existing definitions where competitiveness is not affected [16], which means organisations can make rapid changes to sensitive information without worrying about the impact. Their model showed that business process and business activities allow an organization to be competitive. Another issue they brought up was-Why would one consider an ontology centric approach when there are so many business process modeling tools. The answer is the *extensibility and adaptability* of business process ontology. It gives a homogeneous adaptable definition platform for multiple entity types and heterogeneous data. They proposed that this business process ontology would then be used in some kind of business process engine [15].

Ideally a standardized ontology should exist, which forms the storage backend of a business process engine. All kinds of information created during business process lifecycle should be stored in a knowledge base. The advantage of business ontology is that heterogeneous base of business process definitions is formed and there is increased vendor independence. Their work was mostly focused on the static information related to a business like location, product etc, and did not provide a detail of other aspects like products or dynamic parts of business like business processes, goals and objectives, strategies, roles, tasks etc.

The *Edinburgh Enterprise Ontology* [14] is a comprehensive description of an Enterprise. It is a collection of terms and definitions relevant to business Enterprise. It is built as a framework suitable for modeling Enterprise projects. Natural language definition concepts were converted to Ontolingua in this project. The content proposed by this Ontology was divided into the following major domains:

- Meta ontology and Time (Entity, Relationship, Role, Time, Interval)
- Activity, Plans, Capability &Resource-(Process Planning, Authority, Resources, Allocation)
- Organization (Person, Legal Entities, Ownership, Organization Units, Manager)
- Strategy (Purpose, Mission, Decision)-this consisted of high level planning of Enterprise.

- Marketing-Selling and marketing of goods and service (Sale, Customer, Price, Brand, Promotion).

The Enterprise Ontology created by *Edinburgh* is not a work done in OWL which is the current standard of representing ontology in Semantic Web. It focuses on producing formal definitions of terms from informal language definitions. Additionally the author also proposed a flexible agent based architecture of the Enterprise Tool Set. The main contribution was developing ontology in an informal way (text version) and converting it to a semi formal way using Ontolingua.

Another work in this area is the *TOVE-(Toronto Virtual Enterprise Project (UofT))* project [35]. *TOVE* identifies concepts for the design of an agile Enterprise. An agile company integrates his/her structure, behaviour and information. The project spans knowledge of activity, time and causality resources, cost, quality, and product and organization structure. The interfaces an Enterprise has to its environment are lacking in *TOVE*. Generally the notion of the creation, distribution and consumption of value in a stakeholder network is not present in *TOVE*. It concentrates in internal workflow of a company but it doesn't capture the outside value exchange network.

OBELIX, [13] the e-business ontology project, is ontology based electronic integration of complex products and value chain. The approach of this project is primarily based on UML class diagrams for modeling. The deliverable they created provides an ontological perspective on the exploration of innovative e-commerce ideas. The approach is called e3-value, is based on the analysis of economic value creation, distribution and consumption in a multi-actor network. On the other hand e3-value is founded on the requirement engineering and underlying conceptual modeling technology borrowed from the information systems community. The core e3-value is extended to allow for economic evaluation of business ideas. For rules and constraints, OCL (object constraint language) is used and finally they provide a RDF/S representation developed with Onto Edit. Resource Event Agent Ontology (REA Ontology) shows the similarities to the e3 value ontology.

Another significant work in this area is been done by *Osterwalder [12]*.The authors set up an ontology for business models. The overall goal was to combine business management research in the domain of business models with more technical and conceptual research in the domain of informatics particularly ontologies. This aimed at applying more complete descriptions in terms of constraints and rules and reasoning of ontologies to the concept of business models. The main components of this ontology are:-

- Infrastructure management (Capability, Partnership, Value Configuration)
- Product Innovation-Value Proposition.
- Customer Relationship-Relationship, Channel, Customers.
- Financial Aspects-Cost, Profit, Revenue.

The main contribution of their work in this area, was to bring business model theory one step further and to apply it to software design for management and Information Systems requirement tools. They also plan on working on the model visualization prototype in their future work. Another project which is based on a UML based approach was the *Business Engineering Model (BEM)*, which represents a set of formalisms to specify the core metadata found in the operational and data warehousing environment of Enterprises in order to support interoperability among them. These concepts are described in UML.

3.3 Rules and Semantic Web Research

"Business rules technology can enable rapid changes to be made without programming and as such is likely to deliver longer term ROI with reduced development and maintenance costs, once the initial phase of capturing rules has been completed"-*Butler group*.

According to work done by *LibRT project [17]*, Semantic Web and Business Rules have common roots in Artificial Intelligence areas like knowledge representation, formal logic and expert systems. Both these technologies are moving towards or support a Model Driven Architecture/technology reuse approach. Business rules are human readable descriptions to specify behaviour and Semantic Web is machine readable descriptions to also specify meaning and behaviour with a more efficient representation. They also have some common standards so far like, HTML, XML, XMI and RDF evolution. According to LibRT, mapping Semantic Web and Business Rules is a challenge [17]. There have been other works done in this area like, by *Benjamin Groof and Mike Dean* in Semantic Web rules with ontologies and E-services applications. They deal with core technologies in terms of knowledge representation languages, in terms of tools they use SweetRules, Jena and in terms of applications they look at policies, services and semantic integration. Their work addresses the issue what business problem these technologies and tools can solve.

In the work by *Goedertier and Vanthienen* [36], on rule based business process modeling and execution, they used a business rule model to represent the semantics of the data and control flow perspectives of the business processes. They show how a business rule model defines and constraints the data elements of a business vocabulary model and the state transitions of a business process model. A generic lightweight process and rule set metamodel that can be the basis of process languages of arbitrary complexity was constructed and also shown how rule based process execution decomposes the processing the event messages in a number of logic queries on an inference engine. Thus they show, how to embed business logic in a service oriented, event driven architectural framework that links the enforcement of rules and the orchestration of services.

In the work by *Mei and Bontas [18]*, on reasoning paradigms for SWRL enabled ontologies, the authors anticipate that the support for SWRL reasoning seems to be a challenge in the Semantic Web, initially due to the undecidability and unavailable practical algorithms in SWRL. The ongoing work intends to eliminate the proposed workarounds by providing algorithms which try to solve the problem of undecidability in specific context.

3.4 Chapter Summary

After analyzing the related work in the area, we can say that the distinguishing feature in our work is that the Enterprise Ontology defines an architecture based on component ontology's, which belong to different domains in an Enterprise. Also, we have incorporated the current rule standard of SWRL to execute business rules on this ontology. It covers a broader set of concepts important to a business Enterprise and which are most commonly used on a daily basis. Most of the other ontologies address limited areas of an Enterprise and fall short to give the complete picture. It is based on the current standards of the Semantic Web in terms on ontology language and rule language. In the chapters ahead, we will see the proposed architecture and details of the approach.

Chapter 4

Proposed Enterprise Ontology Architecture

4.1. Enterprise Ontology Rationale

The rationale behind developing an Enterprise level ontology is the growing trend of using ontologies in business applications. Ontologies are increasingly seen as a key technology for enabling semantics driven knowledge processing. Many applications benefit from semantically enriched information including knowledge management and e-business applications [15]. With the onset of ontologies, business experts will be able to define business information and business processes that can form a knowledge base [31].

This idea of ontology used in business applications or in a larger context like an Enterprise comes from various other business oriented concepts like business rules, business logic, business processes, and data models that are detached from any particular software application. Hence, by creating and using such ontology, we will be able to decouple the knowledge layer from the executable layer.

The idea behind the ***Enterprise Ontology*** is to have a knowledge base of key Enterprise concepts which is semantic in nature and belongs to various domains of a business or an organization. This will enable the businesses to make changes to the existing knowledge easily, adapt to changes in business processes or any business information quickly. These modifications will be done at a level of knowledge base not at the level of application. The proposed Enterprise Ontology architecture not only gives a common platform for bringing together data across the Enterprise in a consolidated form, but allows verifying the data with the existing business rules. The concept of business process modeling and Enterprise modeling has existed long enough to prove its importance from a business perspective. The proposed architecture follows the same lines but provides a better separation of concerns for such a large amount of critical information for a business.

4.2 Proposed Enterprise Ontology

As explained previously, the main aim of the Enterprise Ontology is to allow us to accurately describe the various aspects of an Enterprise. An Enterprise is defined as:

An Enterprise (or "company") is comprised of all the establishments that operate under the ownership or control of a single organization. An Enterprise may be a business, service, or membership organization; consist of one or several establishments; and operate at one or several location [38].

The Enterprise Ontology is the first step on the way to understand the different terms and concepts that exists in a business domain and the relationships between them. This kind of representation makes it easier to modify the information in the knowledge base and address individual issues of each domain. It also makes the knowledge base available for future use in Semantic Web applications.

The envisaged use of this ontology is to serve as reference ontology in an Enterprise. It should provide a business knowledge which defines the most import business related concepts in an Enterprise. It should also provide ontological definitions of some generally used low level information like location, contact information, etc. In terms of scope, the Enterprise ontology contains a wide variety business terms and information which describe the business logic, as well as information about products and users. In term of knowledge sources, during the development of the ontology, we mainly built on already available e-business standards. We also incorporated parts of ontologies which already existed, e.g., the user information ontology. This eliminated the danger of reinventing the wheel.

There are several business related ontology and business related standards like BPMN (Business Process Standard), available on the web. Many of them carry relevant information about business data. Ontology like the *Edinburgh Ontology* is mentioned in Chapter 3 for reference. For example, there are many ontology defining concepts like time representation, location, physical quantities and Enterprise structure. They are however too detailed for general reference ontology on one hand, and on the other hand they are too limited in scope.

4.3 Enterprise Ontology Architecture

The Enterprise Ontology as seen in Fig 4.1 is segmented into domains. This domain based architecture ensures logical separation of concerns. It also enables specialisation and expertise in each separate domain. Having separate domains reduces the complexity of both modifying and creating more information in each domain. Each domain can be built at a different level of abstraction, depending on the requirements. Overall at an Enterprise level there is just a single coherent ontology.

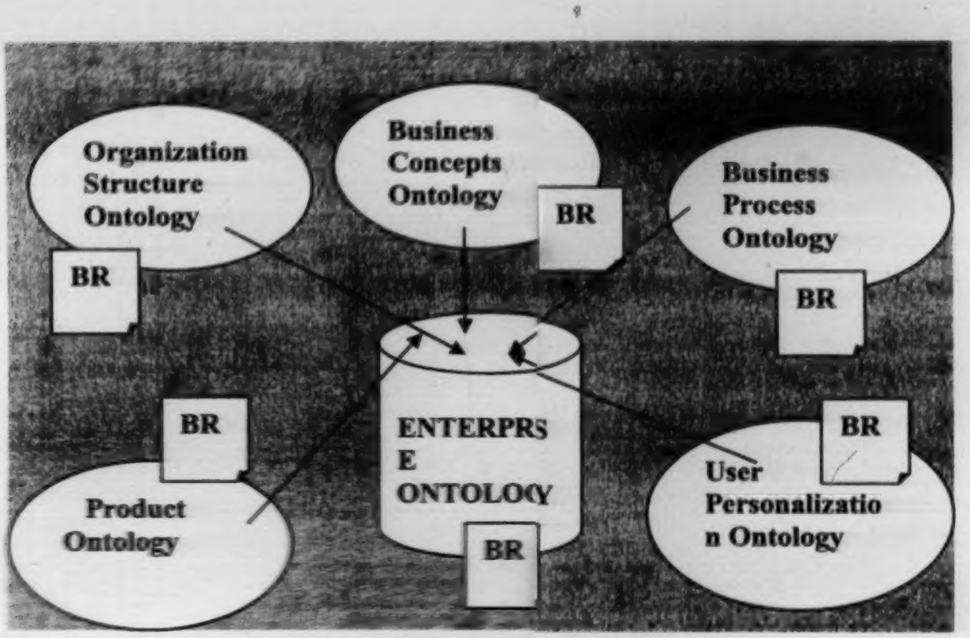

Organization Structure Ontology
Business Concepts Ontology
Business Process Ontology
BR
BR
BR
BR
BR
BR
ENTERPRS
E
ONTOLOGY
Product Ontology
User Personalizatio
n Ontology

Fig 4.1 Enterprise Ontology Architecture

*BR-Business Rules

Every domain in the ontology architecture requires the definitions of common terms and concepts of that domain. Every ontology domain has concepts which are related not only to each other in that particular domain but also to other concepts in different domains. This helps us capture a lot of important relationships and issues between different concepts, which could be both inter-domain and intra-domain.

4.4 Structure of an Enterprise Ontology

In order to construct such an Enterprise Ontology we have implemented five domains where each domain has an individual ontology. As mentioned earlier this separation of domains has advantages like reducing complexity of maintaining and modification of information in each domain. It also enables maintaining different level of abstraction in different domains as per requirements. This approach allows us to create a comprehensive, yet simple Enterprise Ontology.

The five constituent domain ontology's are as follows:

1. Organizational Structure Ontology.
2. Business Concepts Ontology.
3. Business Process Ontology.
4. Product Ontology.
5. User Personalisation Ontology.

1. Organizational Structure Ontology

The Organization Structure Ontology contains concepts which can be applied to all industries and organizations around the globe. It defines basic concepts that can be found and are needed in every organization regardless of the industry. It provides a basic business vocabulary. The Organizational Structure Ontology includes definitions of a multitude of real world things and concepts such as Resources, Organization Units, Roles, Tasks, Privileges, Partners and Job Titles, to name the most important ones. This is a purely business oriented view of an organization without any mention of any other aspects. This is mainly the static information related to an Enterprise. Each of these concepts is explained in detail in the next chapter.

2. Business Concepts Ontology

The Business Concepts Ontology has concepts that distinguish a specific organization in an industry. These concepts differentiate one business from another and very specific for a particular organization. Some of the concept that we have modeled in this ontology are: Business Goal, Business Objectives, Business Strategies, Business Stakeholders, Business Plan, Business Domain, Business Context, Business Values, Business Policies, Enterprise Activities, Enterprise Activity Specification, Location and Business Policies. These again falls under the static information related to an Enterprise. Each of these concepts is explained in detail in the next chapter.

3. Business Process Ontology

This ontology focuses on the dynamic aspects of the business. This is the information which changes more often on a regular basis in an Enterprise. Concepts like Business Process, Business Process Goal, Business Process Strategy and Actors change with time and it is important to make changes to this information and maintain it in a simple way. Once the semantic foundation of Organizational Structure Ontology and Business Concepts Ontology is laid, private and public business processes can be described effectively based on the description of the static business aspects described so far. In the Business Process Ontology we see the business aspects and technical aspects coming together in a more dynamic form. This ontology contains the most critical part of the organizations business model, the business processes. It contains concepts like Business Documents, Business Activities, Business Process, Business Events, Business Artefact, Business Process Goal, Business Process Objective, Business Process Diagram, Control Flow, Applications, Actor, Services and Process Patterns. Each of these concepts is explained in detail in the next chapter.

4. Product Ontology

An Enterprise is recognised and differentiated from other businesses based on the products and services it provides. Hence these are the aspects which are very specific to a given Enterprise and also are its differentiating factors. In the Product Ontology we define the details related to the particular product that the Enterprise manufactures or creates. In our research we use a PC (Personal Computer) as our product, and hence the details reflect the concepts related to a PC. Product Ontology contains concepts like Component Manufacturer, Computer Manufacturer, Product, Recommend Item, Sales Order, and Standard Definition Type. Each of these concepts is explained in detail in the next chapter.

5. User Personalization Ontology

The User Personalization Ontology is used to express the static and dynamic aspects of information related to a particular person. This person can be an end-user or customer, or an employee of the Enterprise. This ontology contains all the details regarding a person in context. It contains concepts like Static Information, Dynamic Information, Network Information, Software Information, Demographic Information, Hardware Information, etc. This kind of information can be helpful in various scenarios, e.g. in trying to personalise the customer shopping experience or employee satisfaction. Each of these concepts is explained in detail in the next chapter. This ontology is defined mainly due to the fact that user, whether the end user of an application or of an internal business service is critical and important for a business.

4.5 Chapter Summary

In this chapter we described the conceptual overview of the proposed Enterprise Ontology architecture. We have described the goal, scope and knowledge sources for the Ontologies. Then we explained the proposed architecture diagram and described the conceptual overview of each of the components of the Enterprise Ontology. Each of these components is explained in detail in the next chapter.

Chapter 5

Components of Enterprise Ontology

The Enterprise ontology has five main components: the Organizational Structure Ontology, the Business Concepts Ontology, the Business Process Ontology, the Product Ontology and the User Personalization Ontology. Each of these ontology components are explained in detailed in the sections below. The explanations below indicate the definitions of terms and concepts, the properties and the relationships. As discussed previously, each ontology has various data and object properties. The chapter includes diagrams from *Ontoviz* and *OWLviz*, both of which are a part of Protégé tool, for ontology visualization. Each of these tools helps us to see ontology from a different perspective. *OWLviz* is primarily used for representing a hierarchy of ontologies, while *Ontoviz* focuses on properties of the ontology concepts.

Section 5.1 Organizational Structure Ontology Description

Business semantics are critical for successful interfacing business processes. Hence we describe the static information related to an Enterprise in this ontology. Figure 5.1 *(OWLviz)* shows the hierarchy in the Organizational Structure Ontology. The main or primary concepts like *Task, Customer, Resource, Organization, Privilege, Partner, Job Title, and Organization Unit* are shown in the first level in the hierarchy below. These concepts are then classified and defined in further details in the subsequent levels. The diagram below represents the super class-subclass relationships existing in the ontology structure. This is also known as the taxonomy or the hierarchy structure of the ontology. For example as shown below, the concept *Role* is a super class for *System Role, Partner Role* and *Person Role.*

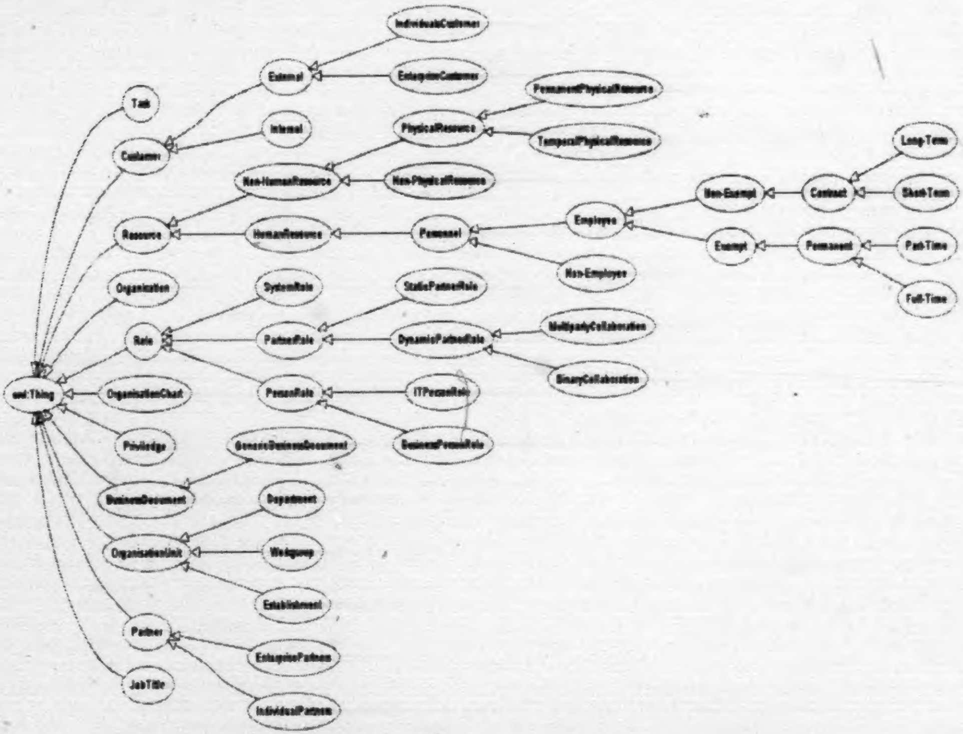

IndividualCustomer
External
EnterpriseCustomer
PermanentPhysicalResource
Task
Internal
PhysicalResource
TemporalPhysicalResource
Customer
Long-Term
Non-HumanResource
Non-PhysicalResource
Non-Exempt
Contract
Short-Term
Employee
Resource
HumanResource
Personnel
Exempt
Permanent
Part-Time
Non-Employee
Organization
SystemRole
StaticPartnerRole
Full-Time
MultipartyCollaboration
Role
PartnerRole
DynamicPartnerRole
BinaryCollaboration
owl:Thing
OrganisationChart
PersonRole
ITPersonRole
Priviledge
GenericBusinessDocument
BusinessPersonRole
BusinessDocument
Department
OrganisationUnit
Workgroup
Establishment
Partner
EnterprisePartner
JobTitle
IndividualPartner

Figure 5.1 Makeup of Organization Structure Ontology

We can also review the ontology from a different perspective – looking at the details of concepts. The diagram in Fig. 5.2 *(Ontoviz)* shows a few concepts of the Organization Structure Ontology at the definition level and also at the instance level. It shows the definition and instance diagrams of the concept *Organization,* and the definition and instance diagrams of the concept *Organisation Chart,* and also shows the relationships between the two concepts.

The black squares depict the definitions and the grey squares show the instances. In the definitions we can see the various property names of a type "string", which would be a data property. There are also object properties. The definition shows the name of the instance, for example the concept *Organization Chart* has an object property *referencesOrganization* that points to an instance of another concept *Organization*. The definitions show the constraints and conditions associated with instances e.g. the organization chart can have "*exactly 1*" name.

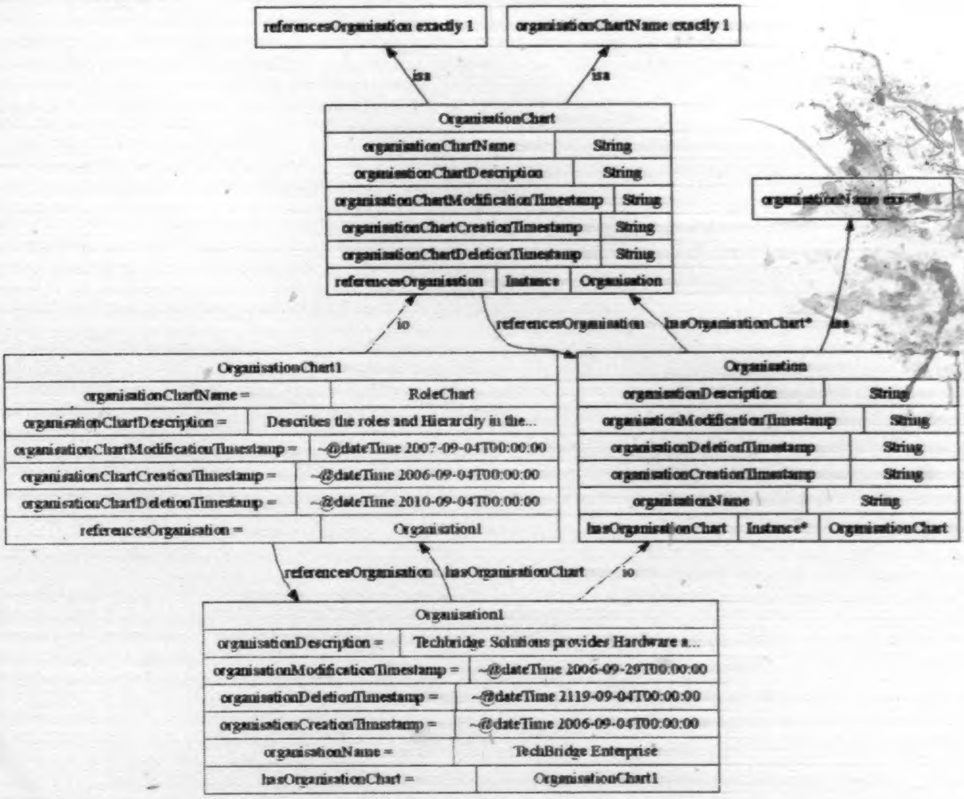

referencesOrganisation exactly 1
organisationChartName exactly 1
isa
isa
OrganisationChart
organisationChartName | String
organisationChartDescription | String
organisationChartModificationTimestamp | String
organisationChartCreationTimestamp | String
organisationChartDeletionTimestamp | String
referencesOrganisation | Instance | Organisation
organisationName exactly 1
io
referencesOrganisation
hasOrganisationChart*
isa
OrganisationChart1
organisationChartName = | RoleChart
organisationChartDescription = | Describes the roles and Hierarchy in the...
organisationChartModificationTimestamp = | ~@dateTime 2007-09-04T00:00:00
organisationChartCreationTimestamp = | ~@dateTime 2006-09-04T00:00:00
organisationChartDeletionTimestamp = | ~@dateTime 2010-09-04T00:00:00
referencesOrganisation = | Organisation1
Organisation
organisationDescription | String
organisationModificationTimestamp | String
organisationDeletionTimestamp | String
organisationCreationTimestamp | String
organisationName | String
hasOrganisationChart | Instance* | OrganisationChart
referencesOrganisation
hasOrganisationChart
io
Organisation1
organisationDescription = | Techbridge Solutions provides Hardware a...
organisationModificationTimestamp = | ~@dateTime 2006-09-29T00:00:00
organisationDeletionTimestamp = | ~@dateTime 2119-09-04T00:00:00
organisationCreationTimestamp = | ~@dateTime 2006-09-04T00:00:00
organisationName = | TechBridge Enterprise
hasOrganisationChart = | OrganisationChart1

Figure 5.2 Definition and Instance descriptions of Concepts

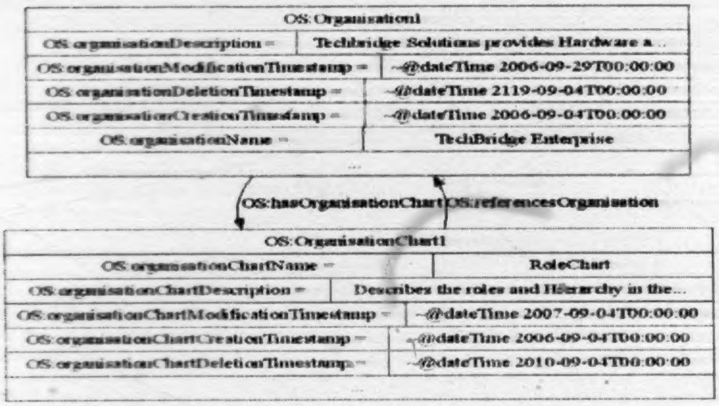
The object properties between the various concepts are shown along the arrows e.g. the *referencesOrganization* property between *Organization* and *OrganizationChart* concepts. In case of instances, as we can see, each property is shown along with the value assigned to the instance, e.g. the organization chart name in Fig 5.2 is *Role Chart* for the shown instance.

The rest of the section is dedicated to the description of the main concepts of the Organization Structure Ontology.

The prefix "OS" shows that, the concepts belong to the Organizational Structure Ontology.

Organization: An organization is a commercial, academic, non-profit, government, or military entity. It consists of individuals who work together toward common goals. An organization is a group of people who cooperate systematically to conduct business. They all work within some kind of organizational structure in the company.

We can call these business units, departments, divisions and so on. These groups enable us to coordinate the finance, chains of command, and assignments within the organization.



OS:Organisation1

OS:organisationDescription = Techbridge Solutions provides Hardware a...

OS:organisationModificationTimestamp = ~@dateTime 2006-09-29T00:00:00

OS:organisationDeletionTimestamp = ~@dateTime 2119-09-04T00:00:00

OS:organisationCreationTimestamp = ~@dateTime 2006-09-04T00:00:00

OS:organisationName = TechBridge Enterprise

...

OS:OrganisationChart1

OS:organisationChartName = RoleChart

OS:organisationChartDescription = Describes the roles and Hierarchy in the...

OS:organisationChartModificationTimestamp = ~@dateTime 2007-09-04T00:00:00

OS:organisationChartCreationTimestamp = ~@dateTime 2006-09-04T00:00:00

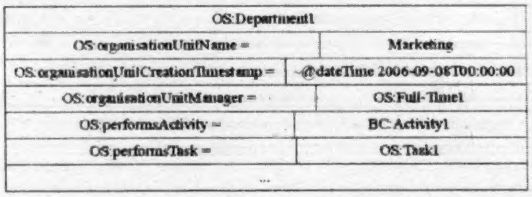
OS:organisationChartDeletionTimestamp = ~@dateTime 2010-09-04T00:00:00

...

Organization Chart: It is a chart which shows the lines of responsibility between the organization-units of an organization. It can represent various types of information, depending on the purpose and domain of the chart. It can be a role chart showing various roles assigned to different people or it can be a hierarchy chart showing the hierarchy of various positions in the organization. It basically depends on the purpose of the diagram and it is totally up to user's discretion to determine its purpose.

Organization Units: These are the administrative units of an organization. Each child organization unit can have one parent organization unit. The three types of organization units that we have described are Departments, Workgroup and Establishments.

An Enterprise will have various departments like marketing, sales, IT etc. It will also have different workgroups which can have people from same or different departments. Also there will be different establishments, since we are talking in terms of an Enterprise, which can have geographically distributed units.



OS:Department1	
OS:organisationUnitName =	Marketing
OS:organisationUnitCreationTimestamp =	~@dateTime 2006-09-08T00:00:00
OS:organisationUnitManager =	OS:Full-Time1
OS:performsActivity =	BC:Activity1
OS:performsTask =	OS:Task1
...	

Here the various data type and object properties relate to different organization units can be seen. For example, for the concept, department (see the instance diagram above) we can see: what the timestamps (show the associated date and time) are, who the organization unit manager is, and which in term shows that he/she is a full time resource. Each property has unique information associated with it, like, the timestamps show the exact date and time the department was created, modified or deleted from the organization structure. The diagram above also indicates what are the different activities and tasks that the unit performs.

Workgroup1	
OS:includesPersonnel =	OS:Part-Time1
OS:WorkgroupreferencesPriviledge =	OS:Priviledge1
OS:organisationUnitName =	EnvironmentalPolicy(2037)Review Wrkgrp
OS:organisationUnitManager =	OS:Full-Time3
OS:performsActivity =	OS:Simple1
...	

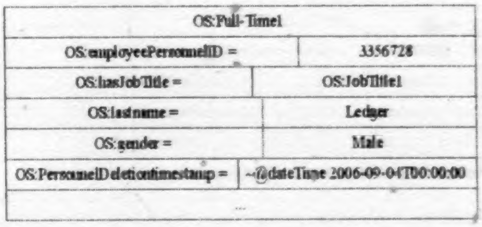
Similarly we can see the corresponding object and data type properties for the other two types of organization units, *Workgroups (shown above)* and *Establishments (shown below)*. In the instance diagram below we can also see that the "*performs activity*" object property relates to the concept "A*ctivity*" which is a part of the Business Concepts (BC) ontology. Hence we can see that not only are the concepts inter-related in a domain but also across various domains in the Enterprise ontology.

OS:Establishment1	
OS:hasLocation =	BC:Country2
OS:organisationUnitName =	TechBridge India
OS:organisationUnitModificationTimestamp =	~@dateTime 2006-09-04T00:00:00
OS:organisationUnitManager =	OS:Full-Time2
OS:performsActivity =	BC:Activity1
...	

Resource: A resource is a source of supply or support, i.e. an available means. A resource can be a labour, capital, purchased services, proprietary software, land, raw material, machines, facility, equipment, etc. The resource shown below is a product catalogue. It also shows the object property indicating which activity process uses it as a resource.

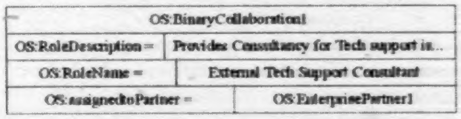
OS:Resource1	
OS:resourceDescription =	E-Product Catalog is used by e-promotion...
OS:resourceName =	E-Product Catalog
OS:resourceDeletionTimestamp =	~@dateTime 2008-09-07T00:00:00
OS:isusedbyActivity =	BC:Activity1

As we can see below the resource is a type of personnel resource, who has a personnelID. This can in turn be of two type's full time or part time. Each of these is further classified into exempt and non exempt employees. Both the figures indicate mostly the data type properties associated with these resources. The example below also contains the object property in terms of its relation with the Job title and indicates what job title the personnel hold.



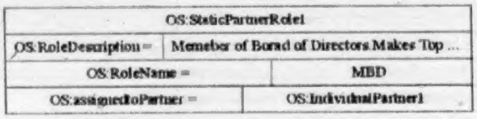
OS:Full-Time1	
OS:employeePersonnelID =	3356728
OS:hasJobTitle =	OS:JobTitle1
OS:lastname =	Ledger
OS:gender =	Male
OS:PersonnelDeletiontimestamp =	~@dateTime 2006-09-04T00:00:00
...	

Role: A role defines a functional entity. It defines the responsibility which a certain job title holds. For example, as we can see below, the role is a type of Binary Collaboration Role, the External Technical Support Consultant (Role Name) has the role to provide consultancy for technical support (Role Description) and is also indicates that this role is assigned to an EnterprisePartner1 (assignedtoPartner) organization.

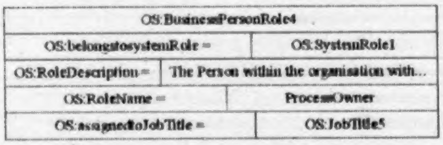


OS:BinaryCollaboration1	
OS:RoleDescription =	Provides Consultancy for Tech support in...
OS:RoleName =	External Tech Support Consultant
OS:assignedtoPartner =	OS:EnterprisePartner1

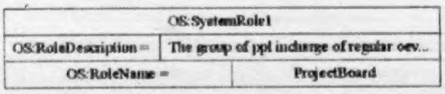
Roles that exist in an Enterprise can be divided into Static or Dynamic partner roles which can be binary collaboration or multiparty collaboration between organizations. It can also be of the type Business person role, IT person role or System person role. One or more business or IT type roles can belong to a system type role.



OS:StaticPartnerRole1	
OS:RoleDescription =	Memeber of Borad of Directors.Makes Top ...
OS:RoleName =	MBD
OS:assignedtoPartner =	OS:IndividualPartner1



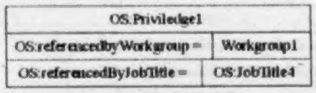
OS:BusinessPersonRole4	
OS:belongstosystemRole =	OS:SystemRole1
OS:RoleDescription =	The Person within the organisation with...
OS:RoleName =	ProcessOwner
OS:assignedtoJobTitle =	OS:JobTitle5



OS:SystemRole1	
OS:RoleDescription =	The group of ppl incharge of regular oev...
OS:RoleName =	ProjectBoard

The diagrams above show the different types of Partner role, which are, Static Partner role, Business Partner role, and the System Partner role. They also show the role name, the role description, and the job title assigned to each of these roles.

Privilege: These are the special powers invested in each job title or role. Each preference is referenced by a particular organization unit like a workgroup or a job title, as indicated by the object properties (see figure below).



OS.Priviledge1	
OS:referencedbyWorkgroup =	Workgroup1
OS:referencedByJobTitle =	OS:JobTitle4

Partner: The term partner indicates that an Enterprise can have collaboration with another organization, Enterprise or another individual. The figures below indicate the various data properties associated with both individual and Enterprise type of partners. It shows the various contact detail information like partner name, phone number, login password, etc. Also it shows the type of partner like static or dynamic, binary or multiparty. These type of partner give more detail in terms of involvement of the Enterprise with the partner.

OS:EnterprisePartner1	
OS:PartnerDescription =	Software Company.Helps provide consultan...
OS:PartnerPhoneNumber =	98902
OS:PartnerName =	TechSoft Consultancy
OS:PartnerLoginPassword =	345yf6
OS:PartnerType =	BinaryDynamic
...	

OS:IndividualPartner1	
OS:PartnerDescription =	Member of Board of Directors.
OS:PartnerPhoneNumber =	3453372
OS:PartnerName =	Dave Hurt
OS:PartnerLoginPassword =	ry5h33
OS:PartnerType =	Static
...	

Task:

A Task is a unit of work, performed by a single role. It is defined from the organizational perspective. Each task is associated with a role and job title. This is indicated by the object property *performedByJobTitle.* We can also see the associated timestamps of the task. These timestamps refer to the deletion, creation and modification time and date of a particular task.

OS:Task5	
OS:taskName =	Manage_Sales_and_Promotions
OS:taskDeletionTimestamp =	~@dateTime 2006-09-07T00:00:00
OS:taskCreationTimestamp =	~@dateTime 2006-09-07T00:00:00
OS:taskModificationTimestamp =	~@dateTime 2006-09-04T00:00:00
OS:performedByJobTitle =	OS:JobTitle1
...	

Job title: A job title is an official position in an organization hierarchy. It is a name that reflects a person's authority and responsibility.

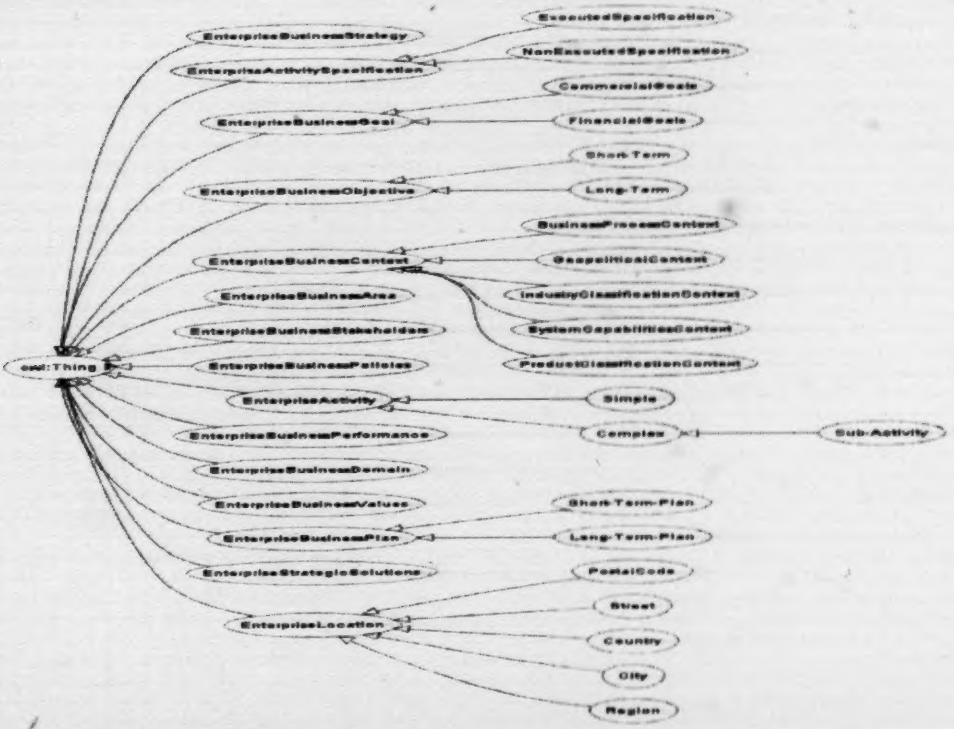
JobTitle1	
jobtitleCreationTimestamp =	~@dateTime 2006-09-04T00:00:00
jobtitleName =	Manager
jobtitleDeletionTimestamp =	~@dateTime 2006-09-04T00:00:00
jobtitleModificationTimestamp =	~@dateTime 2006-09-04T00:00:00
performstask =	Task5
...	

The instance above refers to JobTitle1 shows the task that this job title has to perform, which is *Task 5* in this case. The properties shown in the instance diagram above are very straightforward. They show the various values of the timestamps, i.e. the data type properties and the "*performs task*" object property which relates every job title to a specific task like "task5".

These are the various concepts which form the organization structure ontology. These terms define the static concepts in an organization which are universal to any organization irrespective of the type of organization or the size etc.

Section 5.2 Business Concepts Ontology Description

Business Concepts are the high level concepts associated with every business in order for the business to run successfully. In this ontology we describe the static information related to an Enterprise. The figure below (OWLviz) shows the hierarchy in the Business Concepts Ontology. The main or primary concepts like *Business Goal, Business Objectives, Business Domain, Business Strategy, Stakeholders and Business Policies* are shown in the first level in the hierarchy below. These concepts are then classified and defined in further details in the subsequent levels.


owl:Thing
EnterpriseBusinessStrategy
EnterpriseActivitySpecification
ExecutedSpecification
NonExecutedSpecification
EnterpriseBusinessGoal
CommercialGoals
FinancialGoals
EnterpriseBusinessObjective
Short-Term
Long-Term
EnterpriseBusinessContext
BusinessProcessContext
GeopoliticalContext
IndustryClassificationContext
SystemCapabilitiesContext
ProductClassificationContext
EnterpriseBusinessArea
EnterpriseBusinessStakeholders
EnterpriseBusinessPolicies
EnterpriseActivity
Simple
Complex
Sub-Activity
EnterpriseBusinessPerformance
EnterpriseBusinessDomain
EnterpriseBusinessValues
EnterpriseBusinessPlan
Short-Term-Plan
Long-Term-Plan
EnterpriseStrategicSolutions
EnterpriseLocation
PostalCode
Street
Country
City
Region

The rest of the section is dedicated to the description of the main concepts of the Business Concepts Ontology.

The prefix "BC" shows that the concepts belong to the Business Concepts Ontology.

Enterprise Activity: This is intended to capture the notion of anything that involves action. The concept of activity is closely linked with the idea of the doer, which may be a person, organizational unit or machine.

BC:Simple1	
BC:ActivityName =	Environmental Policy Changes

BC:Activity1	
BC:ActivityName =	Product Promotions

***Enterprise Activity Specification*:**

There is a need to refer explicitly to specifications or plans for Enterprise activities. This is provided by the term activity specification. An activity specification specifies at some level of detail one or more possible Activities. If the activity specification has an intended purpose, it is called a Plan.

BC:NonExecutedSpecification1	
BC:ActivitySpecificationName =	ProductPromo1-Doc1
BC:ActivitySpecDescription =	Describes the Business Paln for product ...

Business Area: A business area is a collection of, business process areas, which is a collection of business processes. The business area can be defined by the stakeholders that have direct or immediate indirect influence on the business domain. As seen below the business area has an associated name and timestamps. A business area is a member of a particular business domain.

BC:BusinessArea1	
BC:businessAreaModificationTimestamp =	~@dateTime 2006-09-07T00:00:00
BC:businessAreaName =	e-Promotion
BC:businessAreaCreationTimestamp =	~@dateTime 2006-09-07T00:00:00
BC:businessAreaDeletionTimestamp =	~@dateTime 2006-09-07T00:00:00
BC:memberOfBusinessDomainView =	BC:BusinessDomain1
...	

Business Context: The formal description of a specific business circumstance as identified by the values of a set of Context Categories, allowing different business circumstances to be uniquely distinguished. A unique and meaningful combination of Context values constitutes a business context. The following contexts are identified:

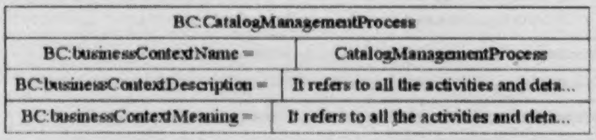
Business Process Context: This is the classification of the Business Process. It is the primary Context Category, and provides many useful distinctions in the analysis of Core Components.

Geopolitical Context: Specifies the semantic and structural variation. This is often the result of regional or cultural factors.

Industry Classification Context: Traditionally, business vocabularies are divided into industry verticals. This Context Category specifies a particular industry type and segment.

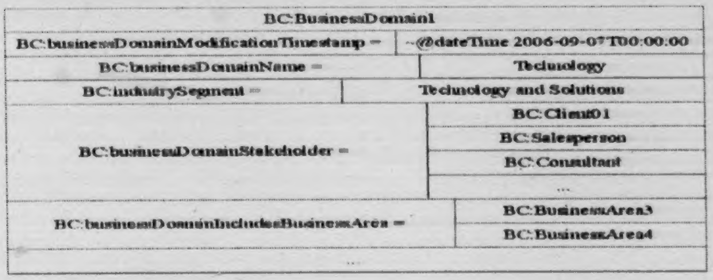
Product Classification Context: There are many types of information that are specific to products or services being traded or referred to in a Business.

Systems Capabilities Context: When a particular semantic or structure is primarily the result of system constraints or compliance with a standard, it is attributable to the System Capabilities Context.



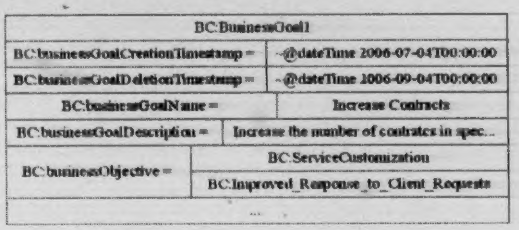
BC:CatalogManagementProcess	
BC:businessContextName =	CatalogManagementProcess
BC:businessContextDescription =	It refers to all the activities and deta...
BC:businessContextMeaning =	It refers to all the activities and deta...

Business Domain: An Enterprise Business Domain helps us in understanding business area sub-process interrelationships. Each business domain has related stakeholders and includes one or more business areas.



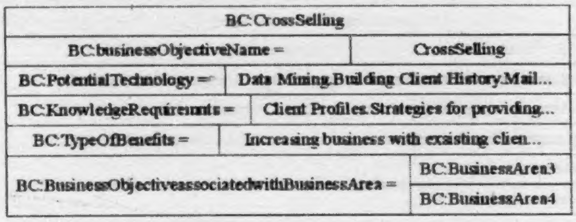
BC:BusinessDomain1	
BC:businessDomainModificationTimestamp =	~@dateTime 2006-09-07T00:00:00
BC:businessDomainName =	Technology
BC:industrySegment =	Technology and Solutions
BC:businessDomainStakeholder =	BC:Client01
	BC:Salesperson
	BC:Consultant
	...
BC:businessDomainIncludesBusinessArea =	BC:BusinessArea3
	BC:BusinessArea4
...	

Business Goal: A business goal represents a high-level requirement. It is a written statement that describes a very broad, often somewhat abstract condition that is expected to be achieved by the organization. Business goals can be arranged in a goal hierarchy. It is the statement of Business Intent. Each business goal helps to fulfill certain business objectives as indicated in the object properties below.

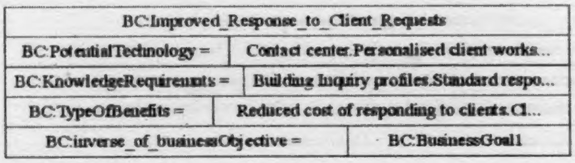


BC:BusinessGoal1	
BC:businessGoalCreationTimestamp =	~@dateTime 2006-07-04T00:00:00
BC:businessGoalDeletionTimestamp =	~@dateTime 2006-09-04T00:00:00
BC:businessGoalName =	Increase Contracts
BC:businessGoalDescription =	Increase the number of contratcs in spec...
BC:businessObjective =	BC:ServiceCustomization
	BC:Improved_Response_to_Client_Requests
...	

Business Objective: A business Objective is something the business is aiming towards or a strategic position it is aiming to achieve. It is usually a step in the strategy. Objectives are similar to goals but often have success or failure rather than quantifiable metrics. It is a carefully written statement that grows out of the business goal describing a pattern of behaviour and/or activities that a business must follow to successfully meet a stated goal. Objectives are the basic building blocks of strategy. Implementing a business strategy is accomplished by translating the vision and strategy into a set of operational objectives that drive behaviour and performance.



BC:CrossSelling	
BC:businessObjectiveName =	CrossSelling
BC:PotentialTechnology =	Data Mining.Building Client History.Mail...
BC:KnowledgeRequirements =	Client Profiles.Strategies for providing...
BC:TypeOfBenefits =	Increasing business with existing clien...
BC:BusinessObjectiveassociatedwithBusinessArea =	BC:BusinessArea3 BC:BusinessArea4



BC:Improved_Response_to_Client_Requests	
BC:PotentialTechnology =	Contact center.Personalised client works...
BC:KnowledgeRequirements =	Building Inquiry profiles.Standard respo...
BC:TypeOfBenefits =	Reduced cost of responding to clients.Cl...
BC:inverse_of_businessObjective =	BC:BusinessGoal1

Business Stakeholders:

Business Stakeholders are groups of people or individuals who have an interest (a stake) in the performance of a Business or Organization. For e.g. Customers, Consumers, Suppliers, Owners, Managers, Government, Community. The figure below shows the data type properties indicating, the stake holder's concerns, stakeholders name and goal. The object property *hasSolution indicates* what strategic solution the stakeholder is involved with.

BC:Manager	
BC:StakeHolderName =	Tedd
BC:StakeholderConcern =	Reduce the cost of transfers between sup..
BC:StakeHolderGoal =	Address Client Problem.
BC:StakeHolderGoalDescription =	To organise the solutions team to addres ..
BC:hasSolution =	BC:StrategicSolutions2
..	

BC:Salesperson	
BC:StakeHolderName =	Mark
BC:StakeholderConcern =	Improve Client Retention
BC:StakeHolderGoal =	Find Clients
BC:StakeHolderGoalDescription =	To find clients needing Products and sup..
BC:hasSolution =	BC:StrategicSolutions1
..	

Business Strategy: Company's Business Strategy is located in the environmental, social and economical context. It shows the strategic direction a business adopts, the values it upholds, the medium and long term objectives and its business plan for a short term. It specifies the organizations objectives, developing policies and plans to achieve these objectives and also allocating resources so as to meet the plans. It is the highest level of managerial activity usually performed by the CEO and executive team. It provides overall directions to the whole Enterprise. An organization strategy must be appropriate for its resources, objectives and customers. The object properties *needstoAchieve, hasObjective, hasPlans* below indicate what goals, objectives and plans a business strategy is related to.

BC:BusinessStrategy1	
BC:BusinessStrategyName =	ImproveCustomerSatisfaction
BC:needstoachieve =	BC:BusinessGoal1
BC:hasObective =	BC:ServiceCustomization
BC:hasPlan =	BC:Short-Term-Plan1

Business Values: By values, we mean the qualitative goals which the company strives to achieve in all its activities. A value is a belief, a mission, or a philosophy that is really meaningful to the company. An example of a business value is: "Customer

Satisfaction." Another example of a value is "Being Ethical and Truthful." Every company has one or more values, whether they are consciously aware of it or not. Another way of saying it is that a value is a statement of the company's intention and commitment to achieve a high level of performance on a specific QUALITATIVE factor.

BC:BusinessValue1	
BC:BusinessValueName =	Integrity
BC:BusinessValueDescription =	We believe ethically. We tell the truth...

BC:BusinessValue2	
BC:BusinessValueName =	Teamwork
BC:BusinessValueDescription =	We work together to achieve superior res...

Enterprise Location:

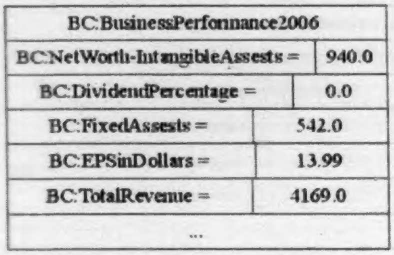
Location describes the geological/physical location of the Enterprise. It is particularly important since it can be associated with not only Enterprise locations but also with other locations, like customer location, product location in transit etc.

BC:Country1	
BC:nameofCountry =	USA
BC:locationDescription =	Corporate Headquarters

BC:Country2	
BC:nameofCountry =	India
BC:locationDescription =	Offshore Office Location

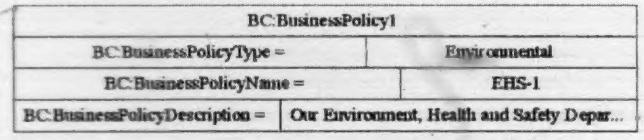
Enterprise Performance:

The Enterprise performance is measured by a set of figures. These are mostly financial figures and indicate the business of an organization.



BC:BusinessPerformance2006	
BC:NetWorth-IntangibleAssests =	940.0
BC:DividendPercentage =	0.0
BC:FixedAssests =	542.0
BC:EPSinDollars =	13.99
BC:TotalRevenue =	4169.0
...	

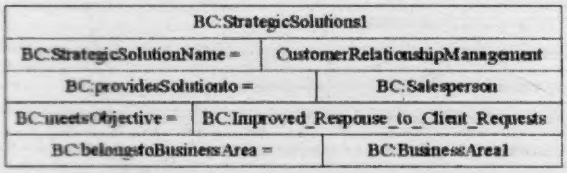
Enterprise Policies: Each Enterprise has a set of policies or rules it abides to while performing any kind of activities within the organization. These set of policies are related to different areas for e.g. *environmental policy* or *health and safety policy*. As we can see below, the policy ahs an associated name, policy type and the policy description.



BC:BusinessPolicy1	
BC:BusinessPolicyType =	Environmental
BC:BusinessPolicyName =	EHS-1
BC:BusinessPolicyDescription =	Our Environment, Health and Safety Depar...

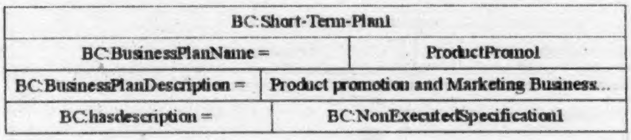
Enterprise Strategic solutions:

This describes the various strategic solutions that an Enterprise makes to deal with challenges and meet certain business objective. These belong to certain business area and provide solution to a stakeholder or a particular role with the Enterprise.



BC:StrategicSolutions1	
BC:StrategicSolutionName =	CustomerRelationshipManagement
BC:providesSolutionto =	BC:Salesperson
BC:meetsObjective =	BC:Improved_Response_to_Client_Requests
BC:belongstoBusinessArea =	BC:BusinessArea1

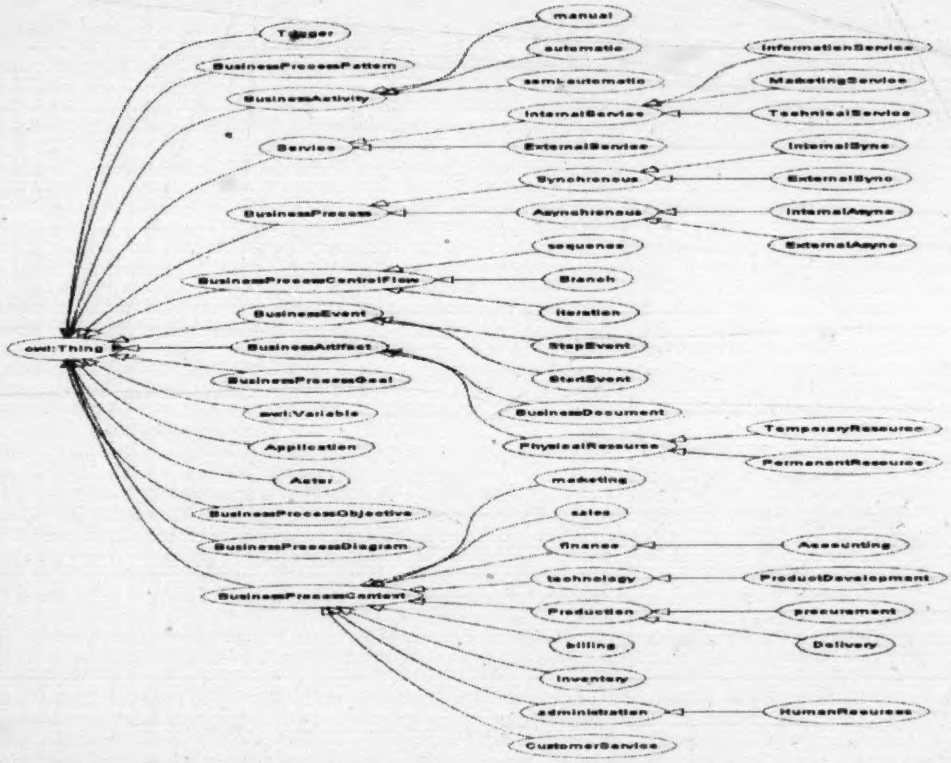
Business Plan: Business plans are either short term or long term. These help to meet certain business objective. Business plans are created to achieve certain milestones along the way while trying to achieve a certain goal or objective. As seen below, the business plan had an associated name, description and specification.



BC:Short-Term-Plan1	
BC:BusinessPlanName =	ProductPromo1
BC:BusinessPlanDescription =	Product promotion and Marketing Business...
BC:hasdescription =	BC:NonExecutedSpecification1

Section 5.3 Business Process Ontology Description

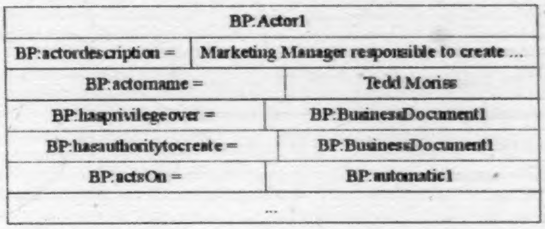
Business process is the most critical part of the information, for an Enterprise. This information depicts how the business runs, what processes are followed, what kind of activities and dependencies exist for each process etc. Hence, we describe the dynamic information related to an Enterprise. Figure below (OWLviz) shows the hierarchy in the Business Process Ontology. The main or primary concepts like *Business Activity, Business Process, Business Artifact, Business Event, Business Process Control Flow, and Business Process Pattern* are shown in the first level of hierarchy below. These concepts are then classified and defined in further details in the subsequent levels.


owl:Thing
Trigger
BusinessProcessPattern
BusinessActivity
Service
BusinessProcess
BusinessProcessControlFlow
BusinessEvent
BusinessArtifact
BusinessProcessGoal
owl:Variable
Application
Actor
BusinessProcessObjective
BusinessProcessDiagram
BusinessProcessContext
manual
automatic
semi-automatic
InternalService
ExternalService
Synchronous
Asynchronous
sequence
Branch
Iteration
StopEvent
StartEvent
BusinessDocument
PhysicalResource
marketing
sales
finance
technology
Production
billing
Inventory
administration
CustomerService
InformationService
MarketingService
TechnicalService
InternalSync
ExternalSync
InternalAsync
ExternalAsync
TemporaryResource
PermanentResource
Accounting
ProductDevelopment
procurement
Delivery
HumanResources

The rest of the section is dedicated to the description of the main concepts of the Business Process Ontology.

The prefix "BP" shows that the concepts belong to the Business Process Ontology.

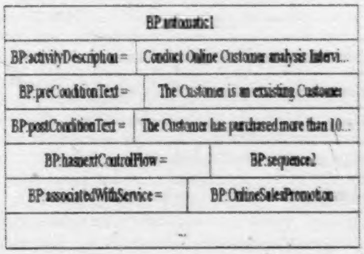
Actor: An actor participates in a part of the process. An actor can also be a Process Owner which means that the actor is accountable and responsible for the working and improving one of the processes defined by the organization and its related sub processes.



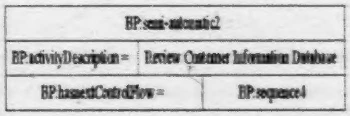
BP:Actor1	
BP:actordescription =	Marketing Manager responsible to create ...
BP:actorname =	Tedd Moriss
BP:hasprivilegeover =	BP:BusinessDocument1
BP:hasauthoritytocreate =	BP:BusinessDocument1
BP:actsOn =	BP:automatic1
...	

Application: A computer-based system that process business information in support of a specific business function such as purchasing, accounting or logistics management, etc. Business application data is produced by such applications.

Business Activity: Business Activity is an atomic unit of work in the context of a business process, which is performed by a Role (role is a concept which is a part of the Organizational Structure ontology), has a specific context and must not be interrupted. As we can see below, the various information associated with a business activity are, the activity description, precondition, post condition, next activity in the flow of a process and the associated service.

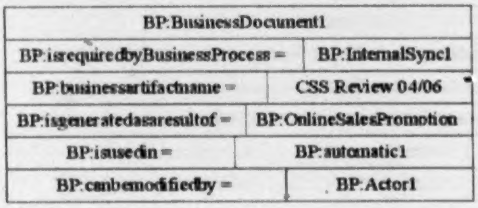


BP:automatic1	
BP:activityDescription =	Conduct Online Customer analysis Intervi...
BP:preConditionText =	The Customer is an existing Customer
BP:postConditionText =	The Customer has purchased more than 10...
BP:hasnextControlFlow =	BP:sequence2
BP:associatedWithService =	BP:OnlineSalesPromotion
...	



BP:semi-automatic2	
BP:activityDescription =	Review Customer Information Database
BP:hasnextControlFlow =	BP:sequence4

Business Artifact: A physical or logical object of significance to a business; for example, a sales order, department, resource. It is a resource item that is required or produced by Business Activity or process like printer or other physical resources etc. As seen below, a business document (artifact) is associated with a business process, can be modified by an actor, can be generated as a result of a process and has a specific name.

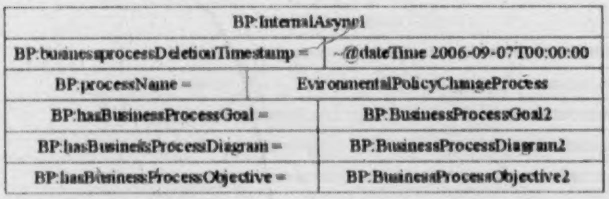


BP:BusinessDocument1	
BP:isrequiredbyBusinessProcess =	BP:InternalSync1
BP:businessartifactname =	CSS Review 04/06
BP:isgeneratedasaresultof =	BP:OnlineSalesPromotion
BP:isusedin =	BP:automatic1
BP:canbemodifiedby =	BP:Actor1

Business Event: A business event is a action which causes the trigger for a business process. A start event marks the start of process and the end event marks the end of the process.

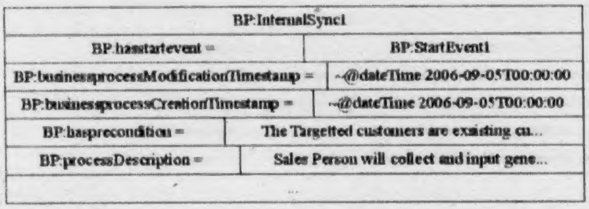
Business Process: The top level definition of the overall process model .It is a set of activities that produces products and services for customers. A Business Process contains many sub processes and activities. A sub process is a collection of related activities and tasks within a process A Business Process or sub process can be of different types based on the type of business interactions they perform(internal, external) or the time dependencies(sync/async).

An *Asynchronous* sub process needs a trigger to start. The main process continues independently of the sub process. By means of a special trigger concept, external events and applications can trigger such a process.



BP:InternalAsync1	
BP:businessprocessDeletionTimestamp =	~@dateTime 2006-09-07T00:00:00
BP:processName =	EvironmentalPolicyChangeProcess
BP:hasBusinessProcessGoal =	BP:BusinessProcessGoal2
BP:hasBusinessProcessDiagram =	BP:BusinessProcessDiagram2
BP:hasBusinessProcessObjective =	BP:BusinessProcessObjective2

A *Synchronous* sub process needs to be started. The main process stops and continues when the sub process has been completed.



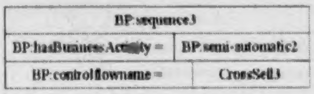
BP:InternalSync1	
BP:hasstartevent =	BP:StartEvent1
BP:businessprocessModificationTimestamp =	~@dateTime 2006-09-05T00:00:00
BP:businessprocessCreationTimestamp =	~@dateTime 2006-09-05T00:00:00
BP:hasprecondition =	The Targetted customers are exsisting cu...
BP:processDescription =	Sales Person will collect and input gene...
...	

Business Process Context:

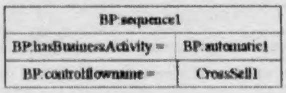
These are the categories which describe the area under which a specific Business Process executes, for e.g. "Procurement"," Sales".

Business Process Control Flow:

Business process control flow specifies the sequence in which the activities or sub processes in a process should take place. It is a construct specifying the order in which actions should be performed.



BP:sequence3	
BP:hasBusinessActivity =	BP:semi-automatic2
BP:controlflowname =	CrossSell3



BP:sequence1	
BP:hasBusinessActivity =	BP:automatic1
BP:controlflowname =	CrossSell1

Business Process Diagram:

It is the static description of the flow of events in a business process. It is also called as workflow diagram. The business process diagram shows the name and the associated timestamps.

BP:BusinessProcessDiagram1	
BP:BusinessProcessDiagramName =	CrossSellingProcessDiagram
BP:BPDCreationTimestamp =	~@dateTime 2006-09-07T00:00:00
BP:BPDDeletionTimestamp =	~@dateTime 2010-09-23T00:00:00

Business Process Goal:

A business process goal is nothing but a statement of business process intent. This process goal is in alignment of the Enterprise goal and also had an associated description.

BP:BusinessProcessGoal1	
BP:GoalDescription =	The Goal of this Business Process is to ...
BP:supports =	BC:BusinessGoal1

Business Process Objective:

A business process objective is something the process is aiming toward or it is working to attain. Usually it is a step in the strategy. Objectives are similar to goals, but often have success/failure rather than quantifiable metrics.

BP:BusinessProcessObjective1	
BP:hasdescripton =	The Objective of this Business Process ...
BP:fulfills =	BC:CrossSelling

Business Process Pattern:

A Business Process Pattern is a frequently occurring sequence of actions which can be reused and thus will save time and cost of modeling. These actions can be processes or sub processes. It defines a reoccurring portion of process flow or reoccurring relationships between process tasks.

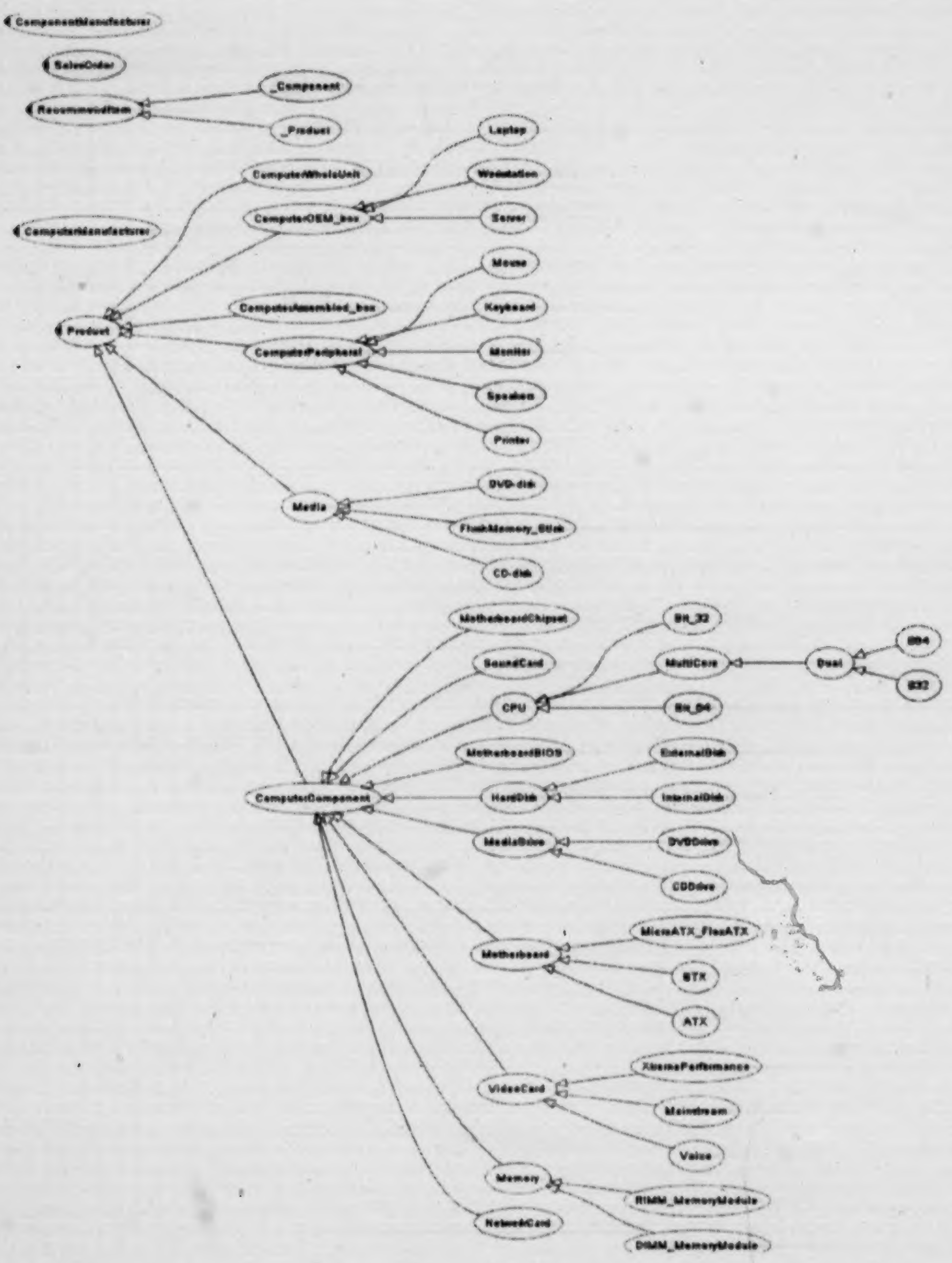
Service:

In the context of Service Oriented Architecture, a service is a self contained business function in which consumers interact through a well defined interface (contract). The consumer does not know (or care) "how" the service implements the requested business action - only that the service performs "what" is defined by its published interface (contract).

BP:OnlineSalesPromotion	
BP:isusedby =	BP:automatic1
BP:interactsWithBusinessObject =	BP:BusinessDocument1

Section 5.4 Product Ontology Description

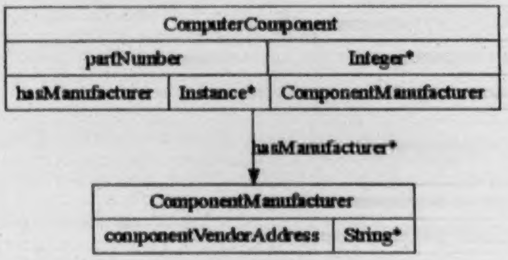
Product Ontology describes the various aspects related to the products that the business manufactures. To show an example we have chosen the product to be PC's(Personal Computers), which we also see as an potential to be used later on, in future work. The figure below shows the hierarchy of the Product Ontology. The main or primary concepts like Component Manufacturer, Computer Manufacturer, Standard Definition Types, Product Sales Order and Recommend Item, are shown in the first level in the hierarchy of the ontology. The figure below shows a part of the product hierarchy. As you can see, these concepts are created keeping in mind the product (PC) itself. Similarly, these concepts may vary depending on the type of product the business generates. These concepts are then classified and defined in further details in the subsequent levels.


ComponentManufacturer
SalesOrder
RecommendItem
_Component
_Product
ComputerWholeUnit
ComputerOEM_box
ComputerManufacturer
Laptop
Workstation
Server
Mouse
Keyboard
ComputerAssembled_box
Product
ComputerPeripheral
Monitor
Speakers
Printer
Media
DVD-disk
FlashMemory_Stick
CD-disk
MotherboardChipset
SoundCard
CPU
Bit_32
MultiCore
Bit_64
Dual
B64
B32
MotherboardBIOS
ExternalDisk
ComputerComponent
HardDisk
InternalDisk
MediaDrive
DVDDrive
CDDrive
MicroATX_FlexATX
Motherboard
BTX
ATX
XtremePerformance
VideoCard
Mainstream
Value
Memory
RIMM_MemoryModule
NetworkCard
DIMM_MemoryModule

The rest of the section is dedicated to the description of the main concepts of the Products Ontology.

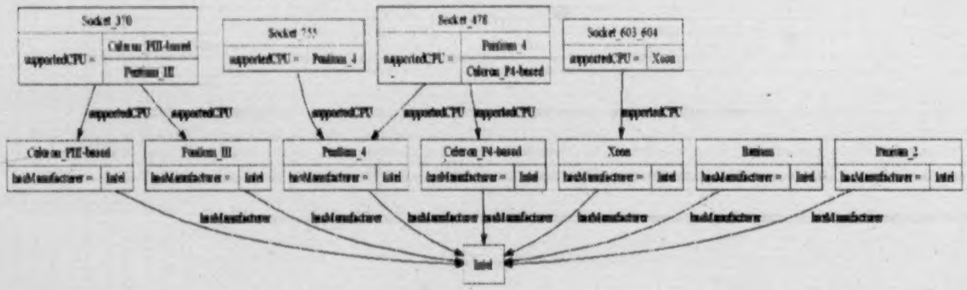
Component Manufacturer:

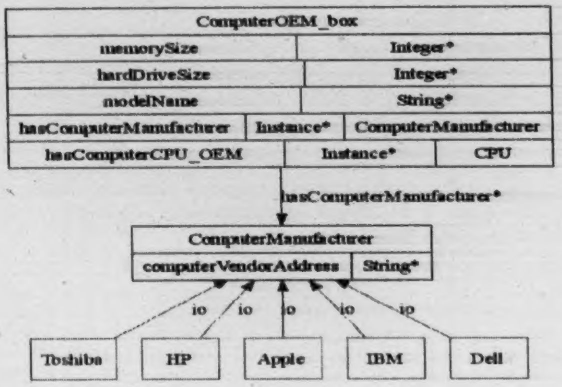
As the name suggests, component manufacturer denotes the data related to all the manufacturers who only provide components or parts of a computer. As we can see below each computer component has an associated component manufacturer. Each component manufacturer has a data type property of the type *string*, which denotes the *componentVendorAddress.*


ComputerComponent
partNumber
Integer*
hasManufacturer
Instance*
ComponentManufacturer
hasManufacturer*
ComponentManufacturer
componentVendorAddress
String*

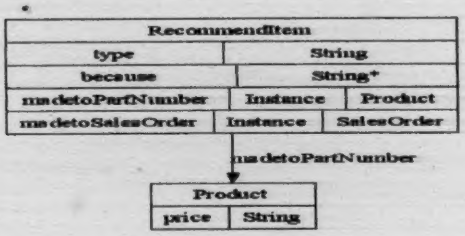
Computer Manufacturer:

This concept denotes all the manufacturers who sell a complete computer as a unit. For example: HP, apple, Dell, IBM etc. These basically provide the computer OEM box. The data type property "*computerVendorAddress*" denotes the manufacturers address and is of the type *String*.


Socket_370
supportedCPU =
Celeron_PIII-based
Pentium_III
Socket_775
supportedCPU =
Pentium_4
Socket_478
supportedCPU =
Pentium_4
Celeron_P4-based
Socket_603_604
supportedCPU =
Xeon
supportedCPU
supportedCPU
supportedCPU
supportedCPU
supportedCPU
supportedCPU
Celeron_PIII-based
hasManufacturer =
Intel
Pentium_III
hasManufacturer =
Intel
Pentium_4
hasManufacturer =
Intel
Celeron_P4-based
hasManufacturer =
Intel
Xeon
hasManufacturer =
Intel
Itanium
hasManufacturer =
Intel
Pentium_2
hasManufacturer =
Intel
hasManufacturer
hasManufacturer
hasManufacturer
hasManufacturer
hasManufacturer
hasManufacturer
hasManufacturer
Intel


ComputerOEM_box
memorySize
Integer*
hardDriveSize
Integer*
modelName
String*
hasComputerManufacturer
Instance*
ComputerManufacturer
hasComputerCPU_OEM
Instance*
CPU
hasComputerManufacturer*
ComputerManufacturer
computerVendorAddress
String*
io
io
io
io
io
Toshiba
HP
Apple
IBM
Dell

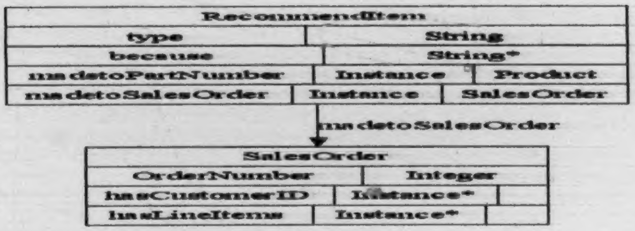
Product: This is the key concept in the ontology which shows all the details related to our product that is computers. The product in this case can be of six different categories. It can be computers assemble box, computer component, Computer OEM box, Computer peripheral, Computer whole unit and media. The Computer assembled box has various components which are assembled together like memory, motherboard, network card, CPU, video card, media drive etc. The computer component describes the various components individually and specifies their part number and prices. The computer peripherals describe all the peripherals associated with computers like printers, monitors, keyboards etc. The computer OEM boxes are the standard computers that are available through standard manufacturers like Bell, IBM etc. It shows the associated model name manufacturer etc. The media specifies the details related to external media like CD, DVD's Flash Memory's etc.


RecommendItem
type
String
because
String*
madetoPartNumber
Instance
Product
madetoSalesOrder
Instance
SalesOrder
madetoPartNumber
Product
price
String

Recommend Item: This concept denotes the items or products that the company wants to recommend to its customers. This concept helps keep track of the part number and sales order the item was recommended to. Hence if we need to retrieve or analyze the information for a customer in future we have the ready information. Based on that we can make recommendations in the future or at least have a track of the customer's history. Shown below, is the various data type and object properties associated with Recommend Item.

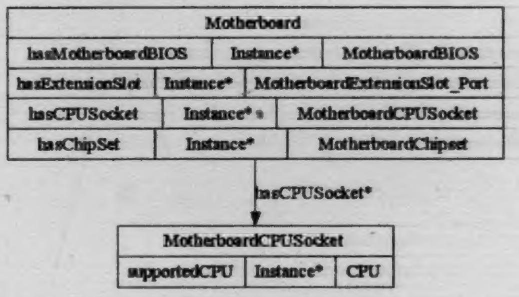
RecommendItem		
type	String	
because	String*	
madetoPartNumber	Instance	Product
madetoSalesOrder	Instance	SalesOrder

Sales Order: Sales order helps to keep track of the customers and products sold to them. Each sales order has an order number. It is related to a customer with the object property "hasCustomerID". Each sales order contains Line items associated and also it reflects its association with a recommend item concept.


RecommendItem
type
String
because
String*
madetoPartNumber
Instance
Product
madetoSalesOrder
Instance
SalesOrder
madetoSalesOrder
SalesOrder
OrderNumber
Integer
hasCustomerID
Instance*
hasLineItems
Instance*

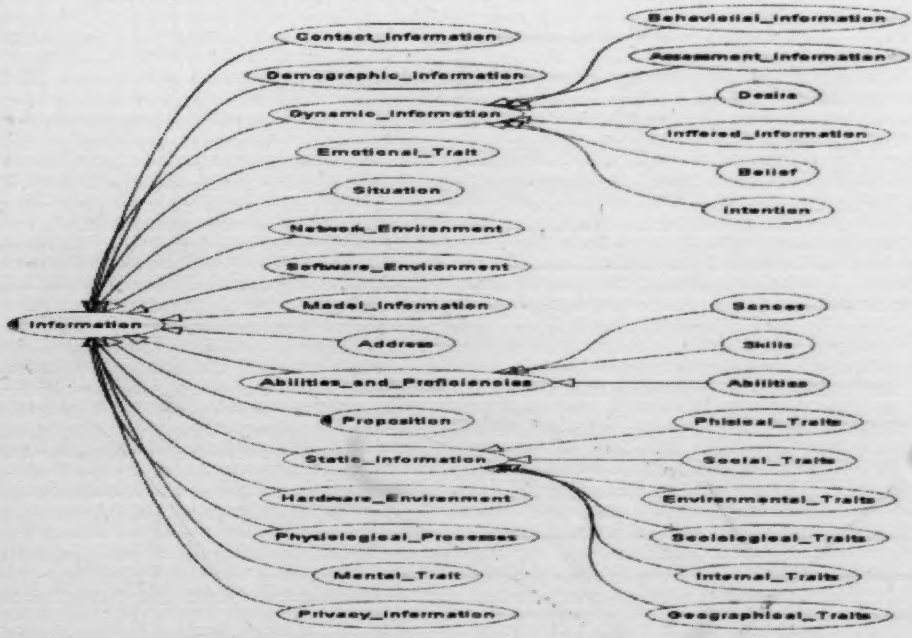
Standard Definition Type:

This concept in the product ontology denotes the various standards based on the product type, which in this case are computers. So it basically denotes all the standards related to various parts of the computer like CD, Hard drive connection, Memory type etc. This can prove to be a template to check what the specifications for different standards etc are.


Motherboard
hasMotherboardBIOS
Instance*
MotherboardBIOS
hasExtensionSlot
Instance*
MotherboardExtensionSlot_Port
hasCPUSocket
Instance*
MotherboardCPUSocket
hasChipSet
Instance*
MotherboardChipset
hasCPUSocket*
MotherboardCPUSocket
supportedCPU
Instance*
CPU

Section 5.5 User Personalization Ontology Description

User Personalization Ontology contains the information which can help us keep track of all the details of a particular person. Here we describe the static and dynamic information related to a person who can be a customer or any other person in the Enterprise. The figure below *(OWLviz)* shows the hierarchy in the User Personalization Ontology. The main or primary concepts like *Demographic Information, Dynamic Information, Static Information, Network Environment,* *Software Environment, Hardware Environment,* etc are shown in the first level in the hierarchy below. These concepts are then classified and defined in further details in the subsequent levels.

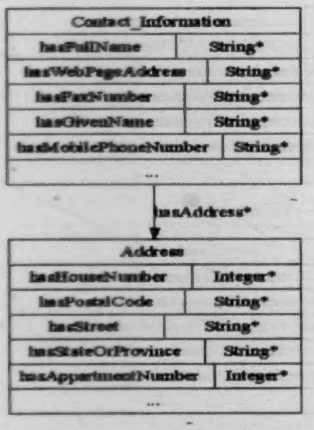

Information
Contact_information
Demographic_information
Dynamic_information
Emotional_Trait
Situation
Network_Environment
Software_Environment
Model_information
Address
Abilities_and_Proficiencies
Proposition
Static_information
Hardware_Environment
Physiological_Processes
Mental_Trait
Privacy_information
Behaviorial_information
Assessment_information
Desire
Inffered_information
Belief
intention
Senses
Skills
Abilities
Phisical_Traits
Social_Traits
Environmental_Traits
Sociological_Traits
Internal_Traits
Geographical_Traits

The rest of the section is dedicated to the description of the main concepts of the User Personalization Ontology.

Information: This information is the details related to the customer/user of the domain of interest. It basically captures all the information related to a person. The figure below shows the various properties associated with information, like, the object property hasPrivacyRestriciton which indicates that the information is associated with some more privacy information .It also shows that the information is created by someone and created at a specific time or date.

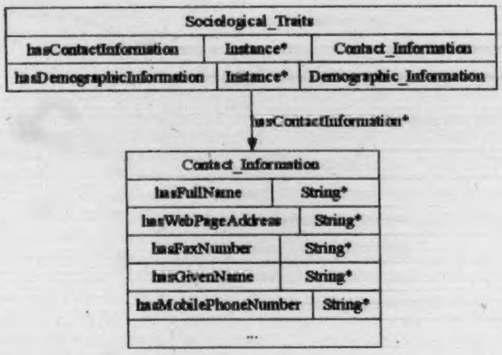
Information		
hasCreatedAt	String*	
hasInformationAbout	Instance*	
hasPrivacyRestriction	Instance*	Privacy_Information
hasCreatedBy	Instance*	

Address: As we start looking the specific information, we see that address is the most common and important piece of information about a person or business. So address includes the geographic information related to the customer like street, postal code etc.


Contact_Information
hasFullName
String*
hasWebPageAddress
String*
hasFaxNumber
String*
hasGivenName
String*
hasMobilePhoneNumber
String*
...
hasAddress*
Address
hasHouseNumber
Integer*
hasPostalCode
String*
hasStreet
String*
hasStateOrProvince
String*
hasAppartmentNumber
Integer*
...

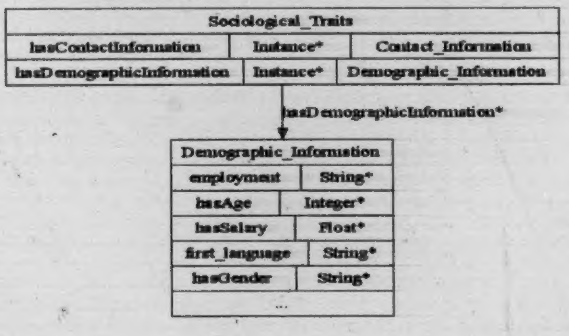
Contact Information:

Next is the contact information. This shows the various means of contacts with the customer like mobile, web, fax etc and their details like web page address or fax number etc.


Sociological_Traits
hasContactInformation
Instance*
Contact_Information
hasDemographicInformation
Instance*
Demographic_Information
hasContactInformation*
Contact_Information
hasFullName
String*
hasWebPageAddress
String*
hasFaxNumber
String*
hasGivenName
String*
hasMobilePhoneNumber
String*
...

Demographic Information:

Demographics show the information related to the socioeconomic or similar factors that define a particular customer. This includes information about the customer's salary, age, gender, first language and employment description. The demographics have a close relation with the sociological traits of the customer, as well.

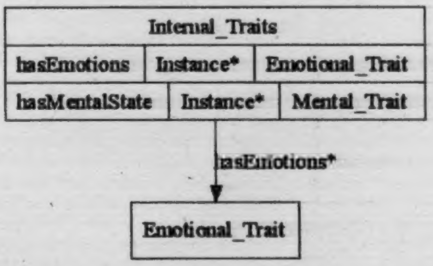

Sociological_Traits
hasContactInformation
Instance*
Contact_Information
hasDemographicInformation
Instance*
Demographic_Information
hasDemographicInformation*
Demographic_Information
employment
String*
hasAge
Integer*
hasSalary
Float*
first_language
String*
hasGender
String*
...

Dynamic Information:

Dynamic information about a customer or business is the details related to the situation and proposition. As the word dynamic suggests, this information is likely to change and is related to concepts like beliefs, desire, intention of a customer or business, at a given time.

Dynamic_Information		
hasProposition	Instance*	Proposition
hasSituation	Instance*	Situation

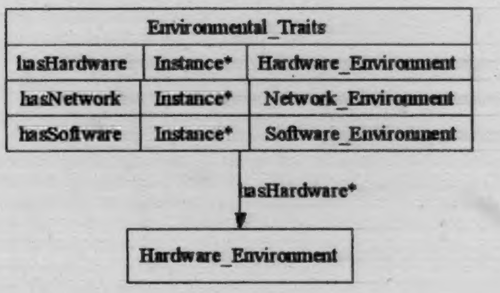
Emotional Trait: Emotional traits of a customer or business can help us determine their buying habits etc. Though it is not quantifiable information, it is one of the important factors used to predict customer behaviour.



Internal_Traits		
hasEmotions	Instance*	Emotional_Trait
hasMentalState	Instance*	Mental_Trait

Hardware Environment:

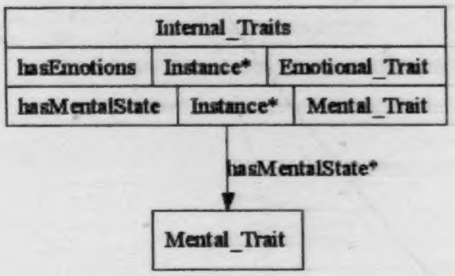
Hardware environment has details about the customers or businesses hardware setup and current configuration. This information is useful for recommending products to the customer/business.



Environmental_Traits		
hasHardware	Instance*	Hardware_Environment
hasNetwork	Instance*	Network_Environment
hasSoftware	Instance*	Software_Environment

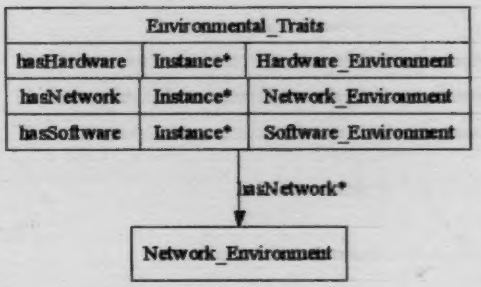
Mental Trait:

A customer may also have mental traits apart from emotional traits as apart of his/her internal traits. This usually helps to capture information about the mental setup and thinking about the customer in various terms like choices made or cancellation criteria's.

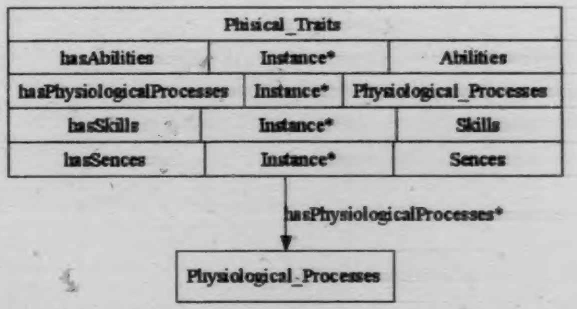

Internal_Traits
hasEmotions
Instance*
Emotional_Trait
hasMentalState
Instance*
Mental_Trait
hasMentalState*
Mental_Trait

Network Environment:

The network environment concept helps to capture information about the customer/business network information to determine their needs and requirement.

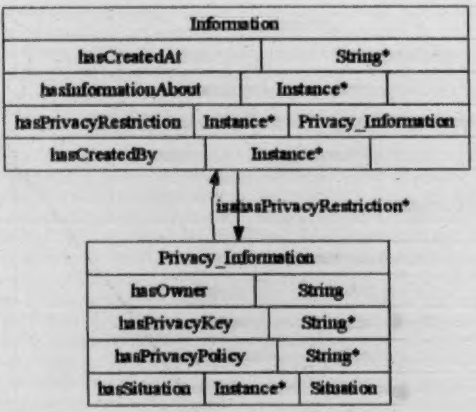

Environmental_Traits
hasHardware
Instance*
Hardware_Environment
hasNetwork
Instance*
Network_Environment
hasSoftware
Instance*
Software_Environment
hasNetwork*
Network_Environment

Physiological Processes


Phisical_Traits
hasAbilities
Instance*
Abilities
hasPhysiologicalProcesses
Instance*
Physiological_Processes
hasSkills
Instance*
Skills
hasSences
Instance*
Sences
hasPhysiologicalProcesses*
Physiological_Processes

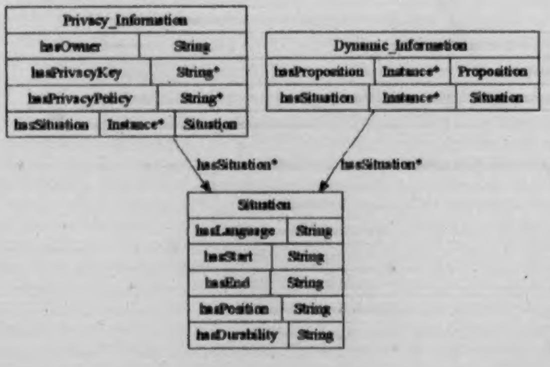
Privacy Information:

The privacy information relat[illegible] to a customer/business has various policies defined for various situations. This information is available to an owner and has a privacy key to access the information.


Information
hasCreatedAt
String*
hasInformationAbout
Instance*
hasPrivacyRestriction
Instance*
Privacy_Information
hasCreatedBy
Instance*
ishasPrivacyRestriction*
Privacy_Information
hasOwner
String
hasPrivacyKey
String*
hasPrivacyPolicy
String*
hasSituation
Instance*
Situation

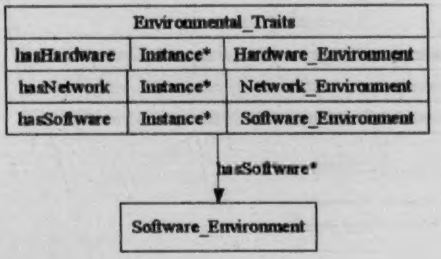
Situation:

Each Customer/business is identified by a situation associated with them. The situation helps define their privacy information and their dynamic information as shown below. The situation denotes the time period, language and position associated with it.


Privacy_Information
hasOwner
String
hasPrivacyKey
String*
hasPrivacyPolicy
String*
hasSituation
Instance*
Situation
Dynamic_Information
hasProposition
Instance*
Proposition
hasSituation
Instance*
Situation
hasSituation*
hasSituation*
Situation
hasLanguage
String
hasStart
String
hasEnd
String
hasPosition
String
hasDurability
String

Software Environment:

Lastly, each customer/business has a certain software environment set up that it uses. This information is helpful in many ways depending whether the customer/business has an online interaction with the company or determining the software products to recommend to them etc.


Environmental_Traits
hasHardware
Instance*
Hardware_Environment
hasNetwork
Instance*
Network_Environment
hasSoftware
Instance*
Software_Environment
hasSoftware*
Software_Environment

Section 5.6 Chapter Summary

In this chapter we described the five layers of the Enterprise ontology architecture in detail. Every ontology was described in terms of the various concepts and terms, data type and object properties and relationships with other concepts. These five ontologies together provide the complete semantics associated with an Enterprise.

Chapter 6

Implementation and Results

6.1 Business Rules

"*A Business Rule is a statement that defines and constraints some aspects of business and is intended to assert business structure and influence the behaviour of the business.*" Business rules control or influence business behaviour. They are a valuable business asset which can help increase agility of an organization if better managed and enforced [28].

A focus on Business Rules is a significant step forward in dealing with complex business applications. Business applications built with current technology are expensive to build and maintain. Their complexity makes it difficult to change the system as the environment changes. This complexity is due to the fact that the business rules which represent complex business logic are buried in code and are not readily available and understandable by the end users and business analysts. Utilization of business rules that are built based on ontologies will make applications more responsive to end users and analysts.

6.2. Business Rule Classification

Business Rules are classified into four basic categories depending on their type and nature. These four categories include almost all kinds of business rules [36].

1. ***Integrity Rules***: This type of rules specifies an assertion that has to be valid in all stages of a system. These constraints specify the conditions that the information must or must not satisfy. An example of a state constraint could be *an authorized user needs username and password.* A process constraint specifies the valid state transitions in a system *e.g. the valid state transitions of a Purchase order are received->processed->acknowledged* [36].

2. ***Derivation Rules***: Such rules are statements of knowledge derived from other knowledge using an inference. Inference rules can be only evaluated using logic based reasoning *e.g. a customer is a gold customer if she is booking regularly. Derivation rules* can be included in ontology to define concepts that are derived from base concepts [36].

3. ***Reaction Rules***: Also known as the "stimulus response rules", "action rules" etc. Such rules specify an action invoked in response to an event only if a certain condition is true. There are various forms of reaction rules. The general form is the Event-Condition-Action-Effect (ECAE) rule, having an effect or a post condition after the action part. Other rules are the ECA rules or the C-A rules also known as the production rules. Production rules derive new information based on the existing information. Business rules that specify the various steps of a business process can be encoded in the form of reaction rules *e.g. if a customer confirms the booking of a flight, then the hotel booking service starts searching for appropriate rooms for this trip* [36].

4. ***Deontic Assignment***: Such rules assign powers, rights and duties to internal agents, define the deontic structure of an organization, and constrain the actions of internal agents. It mainly considers authorizations as business rules *e.g. Only the Store manager can change the Inventory status* [36].

6.3 Business Rules and Semantic Web

There has been a large amount of recent progress in several aspects of Semantic Web rules like fundamental knowledge representation (KR) for rules; integrate rules with ontologies; translations between heterogeneous commercial rule languages, applications in e-business and other domains, etc [30]. Rules in e-commerce and e-business applications can provide ontology-based semi automatic derivation of commercial and business solutions from existing facts and also assist in the explanation of a solution's rationale or the business logic behind it [30].

Ontologies help to standardize, and formalize the conceptualization of a business domain helping users of e-commerce applications to access the business information they need. Using an existing ontology as a foundation, end users, can greatly reduce the cost of implementing a business rules solution. In a business application using business rules, this correlates directly to the vocabulary of definitions required to create and operate the system. For business users, ontologies enable better access to information and promote shared understanding across a business Enterprise [31].

The next section explains our experimentation with Business Rules to enhance the created ontology knowledge base. The rules are created using the SWRL (Semantic Web Rule Language) specification, which is explained in detail in Section 2.6.

6.4 Implementing Business Rules (SWRL) on Enterprise ontology

An Enterprise Ontology is a semantic representation of the structure, activities, process, information, resources, people, behavior, goals. Along with defining these concepts, we have also incorporated rules as a part of the ontology. These rules are actually the business rules that any Enterprise would have. We simulated these constraints (Business Rules) with the help of the rule language SWRL (Semantic Web Rule Language).

6.4.1. Capturing Inter-domain and Intra-domain Business Rules

We reasoned about different possible sets of constraints (Business Rules) for the Enterprise. The Business Rules were generated to verify the concepts in an intra-domain as well as an inter-domain fashion. Each Domain has a set of rules to validate the constraints and concepts. Also we created a set of rules to validate constraints based on relationships of concepts, which belonged to two different domains.

INTRA-DOMAIN RULES SET EXAMPLE:

The rules below show the SWRL rules (Refer SWRL syntax in Section 2.5) which are valid for a particular domain. Their coverage is limited to a single domain. This would enable the Business Rules to be localized and focused in a particular area.

Rule: (Domain-Business Concepts Ontology)

1. The first rule deals with the issue of stakeholders and helps in identifying the domains or areas in which a particular stakeholder belongs to. This information can be further useful to find out what privileges the stakeholder has.

businessAreaStakeholder(?x1,?x2) ∧ isamemberofBusinessDomain(?x1,?x3)→ belongstoBusinessDomain(?x2, ?x3)

It means, that "*If a Business Area x1 has a Business Stakeholder x2 and if Business Area x1 is a member of Business Domain x3, then Business Stakeholder x2 belongs to Business Domain x3*".

2. The second rule deals with the issues of business objectives and goals. The information derived from this rule helps to streamline the business objectives, goals and strategy.

*hasObjective(?x1,?x2) ∧ meetsBusinessGoal(?x2,?x3)→**meetsbusinessgoal(?x1, ?x3)***

The above rule states that "*If a Business Strategy x1 meets Business Objective x2 and if a Business Objective x2 meets Business Goal x3 then the Business Strategy x1 will meet Business Goal x3*".

Rule: (Domain-Business Process Ontology)

3. The third rule deals with the issues of actors in a business process and the related artifacts and privileges of an actor. It defines a complex relationship, controlling the privileges of an actor.

*haspriviledgeover(?x1, ?x2) ∧ isusedin(?x2, ?x3) → **isapartof(?x1, ?x3)***

It means, that "*If an Actor x1 has privilege over a Business Artifact x2 and if the Business Artifact x2 is used in a Business Activity/Business Process x3 then the Actor x1 is a part of the Business Activity/Business Process x3*".

4. This rule shows the relation between a business activity, a business context and a business artifact. This information can be useful in determining the further characteristics of a business activity.

generatesBusinessArtifact(?x1, ?x2) ∧ belongstoBusinessContext(?x1, ?x3) → belongstobusinesscontext(?x2, ?x3)

The above rule states that "*If a Business Activity x1 generates a Business Artifact x2 and if a Business Activity x1 belongs to a Business Context x3 then the Business Artifact x2 will belong to the Business Context x3*".

Rule: (Domain-Organizational Structure Ontology)

5. This organizational structure ontology rule, defines the relationship between a Role and a Job Title in an Enterprise. This can further help us determine the details associated with the role, based on the job title, like privileges and tasks that the role has.

hasrole(?x1, ?x2) ⋀ RoleDescription(?x2, ?x3) → hasroledescription(?x1, ?x3)

It means, that "*If a Job Title x1 has Role x2 and if Role x2 has role description x3 then Job Title x1 has Role description x3*".

6. The next rule defines the relationship between a Job Title, Task and an Organization Unit. Once we know, the particular organization unit a job title belongs to, we can find further details related to it.

performedByJobTitle(?x1, ?x2) ⋀ performedByOrgunit(?x1, ?x3) → belongstoOrgUnit(?x2, ?x3)

The above rule states that "*If a Task x1 is performed by a Job Title x2 and if Task x1 is performed by an Organizational Unit x3 then the Job Title x2 belongs to the Organizational Unit x3*".

Rule: (Domain-Product Ontology)

7. This next domain is the product domain. Here, the rule helps to determine is a product can be considered pricy based on the business constraint of defining what

is pricy. So if the constraint mentions that any product of value greater than 10000 is pricy, then we can find out using this rule, which products can be classified as pricy.

PO:Product(?u1) ⋀ hasprodname(?u1, ?u2) ⋀ hasprice(?u1, ?u3) ⋀ swrlb:greaterThan(?u3, 10000.0) → ispricy(?u1, ?u2)

The above rule states that "*If a Product u1 has Product Name u2 and if Product u1 has Price u3 and if the Price x3 is greater than 10,000 then the Product u1 with Product Name u2 is supposed to be considered pricy*".

8. This rule determines the relationship, between a product, line item and the quantity. It helps to determine the number of line items that a product has.

hasLineItem(?x1, ?x2) ⋀ hasquant(?x2, ?x3) → haspartnumber(?x1, ?x3)

The above rule states that "*If a Product x1 has Line Item x2 and if Line Item x2 has Quantity x3 then Product x1 with Quantity x3 has part number x1*".

INTER-DOMAIN RULES SET EXAMPLE:

The rules shown below are the rules which illustrate the constraints created across multiple domains. So the rules show the constraints for the Organization Structure (OS) domain and the Product (PO) domain. This way we could verify the relationships and object properties defined between two different ontologies. The rules defined for inter-domain rule set are much more complex in nature.

Rule: (Domains-Organizational Structure &Product)

9. The rule below relates the Organizational Structure and the Product domains. This rule helps us determine which customers get discount on their purchases

based on their current value of the purchases they made. These kinds of rules are very useful in marketing and customer appreciation. For example, we can create the following rule:

OS:Customer(?x1) ∧ hasID(?x1, ?x2) ∧ hasname(?x1, ?x3) ∧ PO:LineItem(?y1) ∧ hasOrderno(?y1, ?y2) ∧ haspartno(?y1, ?y3) ∧ PO:SalesOrder(?z1) ∧ hascustomerID(?z1, ?x2) ∧ hasON(?z1, ?y2) ∧ PO:Product(?u1) ∧ hasprodname(?u1, ?u2) ∧ haspartnumber(?u1, ?y3) ∧ hasprice(?u1, ?u3) ∧ swrlb:greaterThan(?u3, 10000.0) → getsdiscounton(?x1, ?u2)

A translation of this rule into a human readable format says that "If we have a Customer x1 who has Customer ID x2 and Name x3 and if we have a Line Item y1 with Order number y2 and Part number y3 and if we have a Sales Order z1 which has Customer ID x2 and Order number y2 and if we have a Product u1 with Product Name u2 and Part number y3 ,Price u3 and the price is greater than 10000 then the Customer x1 get a discount on the purchased Product u2.

10. Another example of a rule is a condition that a customer has to satisfy to obtain a discount on a product based on the number of product he purchased. It helps us determine the buying pattern of a customer, by knowing whether he buys a product in bulk or not, or by knowing which products he buys on a regular basis in large quantities.

OS:Customer(?x1) ∧ hasID(?x1, ?x2) ∧ hasname(?x1, ?x3) ∧ PO:SalesOrder(?z1) ∧ hascustomerID(?z1, ?x2) ∧ hasON(?z1, ?z2) ∧ PO:Product(?u1) ∧ hasprodname(?u1, ?u2) ∧ haspartnumber(?u1, ?u3) ∧ hasprice(?u1, ?u4) ∧ PO:LineItem(?y1) ∧ hasOrderno(?y1, ?z2) ∧ haspartno(?y1, ?u3) ∧ hasquant(?y1, ?y2) ∧ swrlb:greaterThan(?y2, 3) → getsdiscounton(?x1, ?u2)

This SWRL rule says" If we have a Customer x1 who has Customer ID x2 and Name x3 and if we have a Sales Order z1 with Order number z2 and Customer ID x2 and if we have a Product u1 with Product Name u2, Part number u3 and Price u4 and if we have a Line Item y1 which has Order number z2, Part number u3, Quantity y2 and the Quantity is greater than 3 then the Customer x1 get a discount on the purchased Product u2.

The next step in the experiment was to run these SWRL rules on the created knowledge base. Both the types of rules (inter-domain and intra-domain) were then run on a Jess engine. The Jess rule engine can be involved in the Protégé. The rules are converted from SWRL facts to Jess facts, as shown below.

Jess Rule # 1: (Intra-Domain Rule)

(defrule Rule-2 (businessAreaStakeholder ?x1 ?x2) (isamemberofBusinessDomain ?x1 ?x3) => (assert (belongstoBusinessDomain ?x2 ?x3)) (assertOWLProperty "belongstoBusinessDomain" ?x2 ?x3))

Jess Rule # 2: (Intra-Domain Rule)

(defrule Rule-1 (hasObjective ?x1 ?x2) (meetsBusinessGoal ?x2 ?x3)=>(assert (meetsbusinessgoal ?x1 ?x3)) (assertOWLProperty "meetsbusinessgoal" ?x1 ?x3))

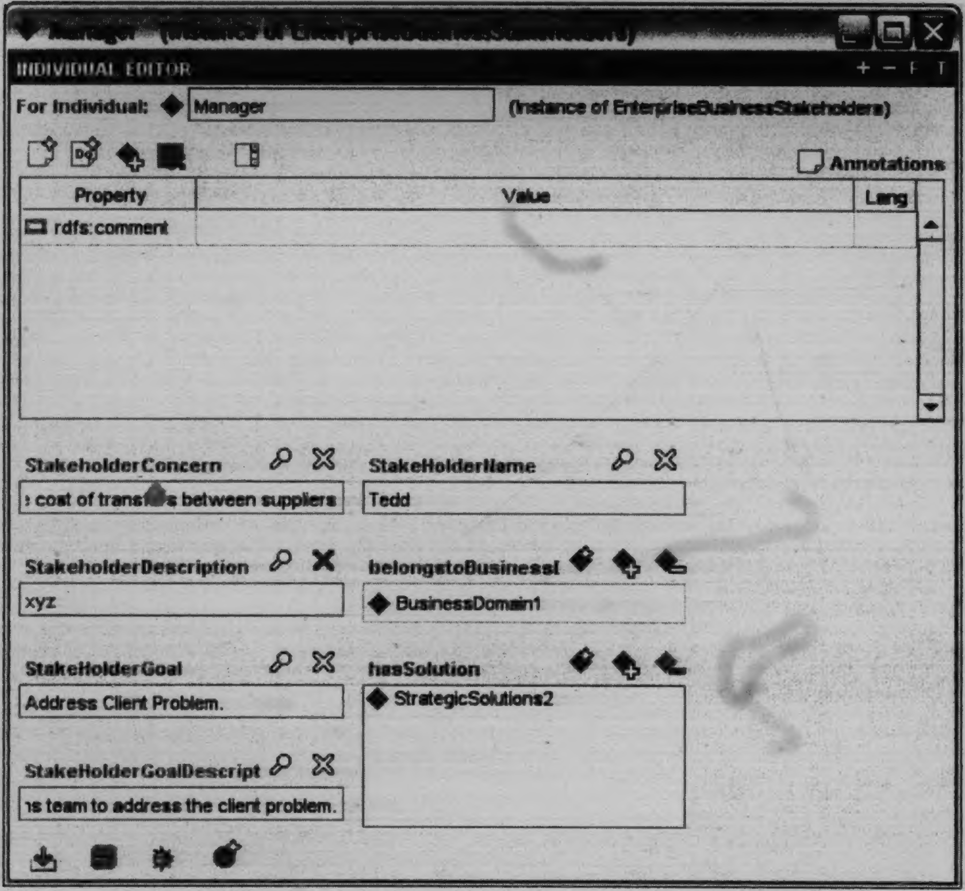
The examples above just show a couple in order to illustrate. These converted Jess rules are then run on the Jess rule engine and show the final results in terms of the properties, classes and individuals asserted after the rules were run on the created knowledge base.

6.4.2. Results and Analysis

The following section explains the results obtained from our experiment and the process of creating the knowledge base for the experiment.

6.4.2.1 Creating Knowledge Base

The process of creating a knowledge base involves instantiation of the defined Enterprise Ontology. Different definitions in the entire five domain ontologies were instantiated to create a knowledge base which would be enable us to involve the defined business rules. This also gave us a better picture to see the dependencies and relationships between the defined concepts. For example, in the figure 6.1, the individual called "Manager" is created as an instance of the "EnterpriseBusinessStakeholder" in the "Business Concept" domain ontology. The details for the individual "Manager" are the stakeholders name, the business domain, the stakeholder goal and goal description, the strategic business solutions he/she contributes to.



For Individual: ◆ Manager (Instance of EnterpriseBusinessStakeholders)

Property	Value	Lang
rdfs:comment		

StakeholderConcern: : cost of trans[illegible]s between suppliers

StakeHolderName: Tedd

StakeholderDescription: xyz

belongstoBusinessI: ◆ BusinessDomain1

StakeHolderGoal: Address Client Problem.

hasSolution: ◆ StrategicSolutions2

StakeHolderGoalDescript: ıs team to address the client problem.

Figure 6.1 Individual "Manager" created in KB (knowledge base)

A number of different individuals (instances) were created in all the five domain ontologies and hence a knowledge base was created.

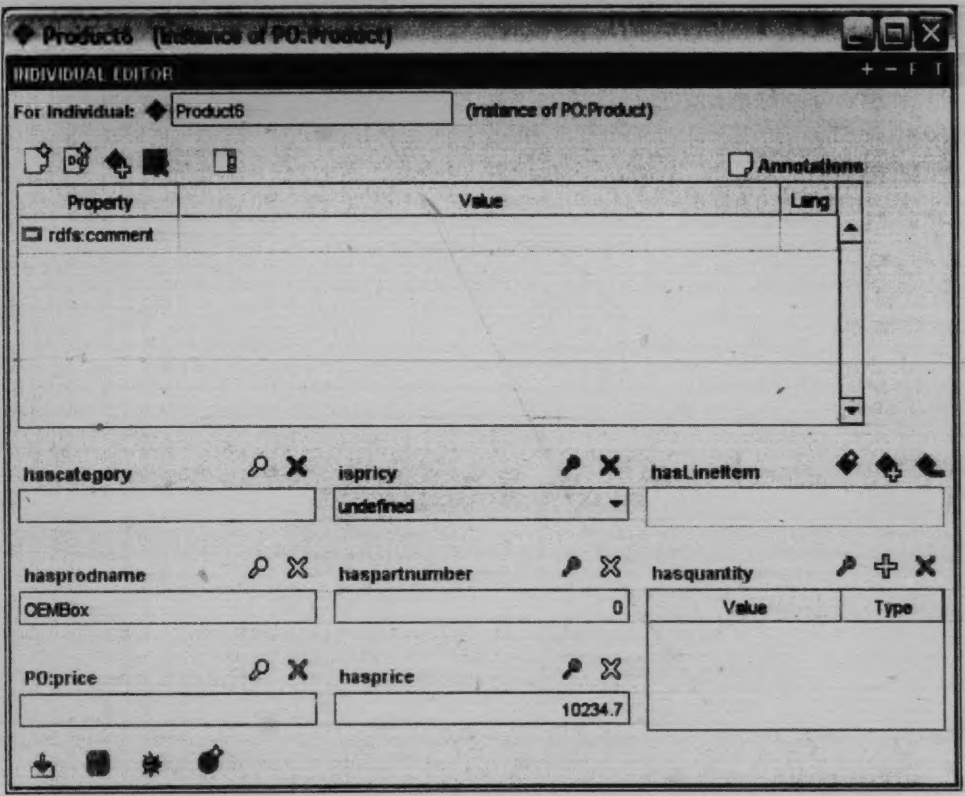
We observed that after executing the simulated business rules on the knowledge base created using the Enterprise Ontology, the desired asserted properties were obtained and hence showed consistency in the ontology definition. For example, for *Rule 7* (Section 6.4.2), the asserted results show that the product "Product 1" and "Product 6" with product names "CDWriter" and "OEMBox" respectively are pricy since they cost more than 10,000 dollars.

Result # 7:

(assert (ispricy Product1 "CDWriter"))

(assert (ispricy Product6 "OEMBox"))

These results were obtained due to the fact that both these products had high prices as we can see in the knowledge base example below for Product 6:


Product6 (instance of PO:Product)
INDIVIDUAL EDITOR
+ − F T
Annotations
Property
Value
Lang
rdfs:comment
hasquantity
Value
Type

For Individual: Product6 (instance of PO:Product)

hascategory:

ispricy: undefined

hasLineItem:

hasprodname: OEMBox

haspartnumber: 0

PO:price:

hasprice: 10234.7

Figure 6.2 Individual "Product 6" created in KB (knowledge base)

Similarly based on the Rule # 9 (Refer Section 6.4.2), the asserted results show that the customer "Customer1" gets discount on the product "OEMBox", as well as on the product "Probase Keyboard".

Result # 9:

(assert (getsdiscounton Customer1 "OEMBox"))

(assert (getsdiscounton Customer1 "Probase Keyboard"))

The above results show that the customer gets discount on the OEMBox and the Probase Keyboard, since both these items were costly items that a particular customer had purchased.

Hence, we see that the rules help us derive new facts that are of dynamic nature, i.e. they "recognise" a specific temporal situation and derive conditions from it, based on the information in the different domain ontologies and the knowledge base (instances) created for these domains. The purpose of this experiment was to show how business rules can be used with ontologies in a much more flexible way. We can say that thanks to rules our ontology is "alive". The rules provide additional and knowledge that would be difficult to "enter" to ontology. This is very important from the point of view of a large and business-oriented domain like and Enterprise.

6.5 Chapter Summary

In this chapter we looked at what is the definition of Business Rules and what they mean in the Semantic Web perspective. Also we saw what the different categorizations of Business Rules are. We then looked at the implementation of our experiment to show that the defined Business Rules work well with all the five domain ontologies and also the Enterprise Ontology. The desired results were obtained and analyzed to see that the experiment was successful.

Chapter 7

Conclusion

Our research initiative to work with the concepts of Semantic Web from an Enterprise perspective enabled us to reinstate our belief that ontology engineering is a core knowledge modeling activity that will have a profound impact on a wide range of Enterprise applications and knowledge integration in the near future.

The contribution of our research can be summarised in the following areas:

- Proposing architecture for Enterprise Ontology.
- Building individual domain ontologies and their integration.
- Implementing rules using SWRL to validate and enhance inter-domain and intra-domain issues.
- Constructing an instance of the Enterprise Ontology and applying rules on it.

This thesis addresses the needs for an approach that clearly defines and represents an Enterprise while taking into consideration such aspects as organization structure, business concepts and processes, manpower, and application domain. We propose to use ontology as a means for representing Enterprise knowledge. The essential feature of this concept is related to the fact that there are two parts of ontology: its definition, and its instance(s). This fact alone makes the proposed approach very attractive.

The application of ontology to represent the entire Enterprise has the following advantages:

- generalization of Enterprise concepts via construction of ontology definition
- categorization of Enterprise concepts by building separate domain ontologies
- integration of different aspects of Enterprise components
- easiness of modifications and dynamic adaptations by enabling separation of concerns
- preparation of grounds for automatic business application execution

Additionally, the rules, which are built using concepts defined in the ontology, provide one more dimensionality to the proposed idea i.e. the dynamics. Rule-wise enhancement of the Enterprise ontology provides a complete picture of the way an Enterprise is built and conducts business. Construction of rules brings the opportunity to develop truly automatic systems for conducting business in a way that reflects specifics of a given Enterprise.

In our work we presented a combination of Semantic web technology with process modelling, Enterprise modelling and business rules to see how effective this idea is. The approach provides us with a common standard for representing business rules and business vocabulary. This representation of technology-executable rules ensures a quick transformation so that they are either directly executable or easily transformed to executable form.

Our goal was to provide an extensive ontology based on concepts of an Enterprise.We combined semantically described business processes, organization structures, and business concepts with SWRL rules by a set of shared ontologies, capturing knowledge about a business domain, product and personal user information.

The proposed ontology views the Enterprise as a combination of five domains: the Organisational Structure domain, the Business Concepts domain, the Business Process domain, the User Personalisation domain, and the Product Domain. It is apparent that a huge concept like an Enterprise needs to be broken down into smaller domains to capture the concepts accurately. Ontologies are shared views of domains. They provide conceptualizations that are agreed upon by participants in collaborative action and decision making. The explicit existence of such shared perspectives makes it possible for both people and programs to collaborate by ensuring that everybody makes the same distinctions and uses the same terms with the same meaning.

Furthermore, the SWRL allowed us to describe business rules in a formal specification. The rules can be executed to infer about temporal situations and introduce facts that are true at some specific dynamic conditions, using concepts and terms defined in ontology. Additionally, these formal specifications enabled us to automatically find out if Enterprise concepts satisfy the consistency constraints defined by business rules. These Enterprise concepts can be static – like organizational structure ontology concepts such as role, tasks, etc., or can be dynamic – like business processes.

To sum up the results of the thesis, we can say that using ontology engineering and ontology-based rules, we can provide a tool that empowers organizations in more than one way. In terms of future work we envisage, that additional research activities, can be done in the following different areas, to take the effort to the next level:

- Increase a level of detail of the ontologies.
- Add more rules that will integrate each, domain ontology and all ontologies together (on a level of whole Enterprise).
- Extend the components of personalisation in the user personalisation ontology.

- Replace the PC (product) ontology with generic product and generic service ontologies, in order to make the whole thing a truly generic ontology.

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APPENDIX A- Enterprise Ontology (Source Code-XML)

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<!DOCTYPE rdf:RDF [
   <!ENTITY dcterms "http://purl.org/dc/terms/" >
   <!ENTITY foaf "http://xmlns.com/foaf/0.1/" >
   <!ENTITY owl "http://www.w3.org/2002/07/owl#" >
   <!ENTITY swrl "http://www.w3.org/2003/11/swrl#" >
   <!ENTITY swrlb "http://www.w3.org/2003/11/swrlb#" >
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   <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" >
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   <!ENTITY BP "http://www.owl-ontologies.com/BP.owl#" >
   <!ENTITY daml "http://www.daml.org/2001/03/daml+oil#" >
   <!ENTITY BC "http://www.owl-ontologies.com/core.owl#" >
   <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#" >
   <!ENTITY swrlImport "http://www.daml.org/rules/proposal/swrl.owl#" >
   <!ENTITY swrlbImport "http://www.daml.org/rules/proposal/swrlb.owl#" >
   <!ENTITY vs "http://www.w3.org/2003/06/sw-vocab-status/ns#" >
   <!ENTITY p1 "http://protege.stanford.edu/plugins/owl/protege#" >
   <!ENTITY xsp "http://www.owl-ontologies.com/2005/08/07/xsp.owl#" >
   <!ENTITY PO "http://www.owl-ontologies.com/Ontology1156283607.owl#" >
   <!ENTITY OS "http://www.owl-ontologies.com/Ontology1156787408.owl#" >
   <!ENTITY p2 "http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#" >
   <!ENTITY UP
 "http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#" >
 ]>


 <rdf:RDF xmlns="http://www.owl-ontologies.com/Ontology1160514425.owl#"
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    xmlns:p1="http://protege.stanford.edu/plugins/owl/protege#"
    xmlns:OS="http://www.owl-ontologies.com/Ontology1156787408.owl#"
    xmlns:swrlbImport="http://www.daml.org/rules/proposal/swrlb.owl#"
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    xmlns:BC="http://www.owl-ontologies.com/core.owl#"

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/>
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<!DOCTYPE rdf:RDF [
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   <!ENTITY foaf "http://xmlns.com/foaf/0.1/" >
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   <!ENTITY swrl "http://www.w3.org/2003/11/swrl#" >
   <!ENTITY swrlb "http://www.w3.org/2003/11/swrlb#" >
   <!ENTITY dc "http://purl.org/dc/elements/1.1/" >
   <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" >
   <!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#" >
   <!ENTITY BP "http://www.owl-ontologies.com/BP.owl#" >
   <!ENTITY daml "http://www.daml.org/2001/03/daml+oil#" >
   <!ENTITY BC "http://www.owl-ontologies.com/core.owl#" >
   <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#" >
   <!ENTITY swrlImport "http://www.daml.org/rules/proposal/swrl.owl#" >
   <!ENTITY swrlbImport "http://www.daml.org/rules/proposal/swrlb.owl#" >
   <!ENTITY vs "http://www.w3.org/2003/06/sw-vocab-status/ns#" >
   <!ENTITY p1 "http://protege.stanford.edu/plugins/owl/protege#" >
   <!ENTITY xsp "http://www.owl-ontologies.com/2005/08/07/xsp.owl#" >
   <!ENTITY PO "http://www.owl-ontologies.com/Ontology1156283607.owl#" >
   <!ENTITY OS "http://www.owl-ontologies.com/Ontology1156787408.owl#" >
```

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  <!ENTITY p2 "http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#" >
  <!ENTITY UP
"http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#" >
]>


<rdf:RDF xmlns="http://www.owl-ontologies.com/Ontology1160514425.owl#"
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    xmlns:p1="http://protege.stanford.edu/plugins/owl/protege#"
    xmlns:OS="http://www.owl-ontologies.com/Ontology1156787408.owl#"
    xmlns:swrlbImport="http://www.daml.org/rules/proposal/swrlb.owl#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:BC="http://www.owl-ontologies.com/core.owl#"

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    xmlns:p2="http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#"
    xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
    xmlns:swrlImport="http://www.daml.org/rules/proposal/swrl.owl#"
    xmlns:foaf="http://xmlns.com/foaf/0.1/"
    xmlns:vs="http://www.w3.org/2003/06/sw-vocab-status/ns#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:dcterms="http://purl.org/dc/terms/"
    xmlns:xsp="http://www.owl-ontologies.co[illegible]/2005/08/07/xsp.owl#"
    xmlns:dc="http://purl.org/dc/elements/1[illegible]"
    xmlns:swrl="http://www.w3.org/2003[illegible]1/swrl#"
    xmlns:BP="http://www.owl-ontologies.com/BP.owl#"
    xmlns:daml="http://www.daml.org/2001/03/daml+oil#"
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:PO="http://www.owl-ontologies.com/Ontology1156283607.owl#">
  <owl:Ontology rdf:about="">
    <owl:imports rdf:resource="http://www.w3.org/2003/11/swrl"/>
    <owl:imports rdf:resource="http://www.w3.org/2003/11/swrlb"/>
  </owl:Ontology>
  <swrl:Variable rdf:ID="x1"/>
  <swrl:Variable rdf:ID="x2"/>
  <swrl:Variable rdf:ID="x3"/>
  <OS:Workgroup rdf:ID="AMS">
    <OS:organisationUnitName
rdf:datatype="&xsd;string">AMS</OS:organisationUnitName>
  </OS:Workgroup>
  <owl:ObjectProperty rdf:ID="assignedtoJobTitle">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Role"/>
    <rdfs:range rdf:resource="#JobTitle"/>
  </owl:ObjectProperty>
```

```
<owl:ObjectProperty rdf:ID="assignedtolocation">
  <rdfs:domain rdf:resource="#JobTitle"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="assignedToPersonnel">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#JobTitle"/>
  <rdfs:range rdf:resource="#Personnel"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="assignedtoWorkgroup">
  <rdfs:domain rdf:resource="#Personnel"/>
  <rdfs:range rdf:resource="#Workgroup"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="AuthorofBusinessDocument">
  <rdfs:domain rdf:resource="#Personnel"/>
  <rdfs:range rdf:resource="#BusinessDocument"/>
  <owl:inverseOf rdf:resource="#BusinessDocumentAuthor"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="belongstoOrgUnit">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#JobTitle"/>
  <rdfs:range rdf:resource="#OrganisationUnit"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="belongstoResource">
  <rdf:type rdf:resource="&owl;InverseFunctionalProperty"/>
  <rdfs:range rdf:resource="#HumanResource"/>
  <owl:inverseOf rdf:resource="#includespersonnel"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="belongstosystemRole">
  <rdfs:domain rdf:resource="#PersonRole"/>
  <rdfs:range rdf:resource="#SystemRole"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="benefitsfrom">
  <rdfs:domain rdf:resource="#Customer"/>
</owl:ObjectProperty>
<owl:Class rdf:ID="BinaryCollaboration">
  <rdfs:subClassOf rdf:resource="#DynamicPartnerRole"/>
</owl:Class>
<owl:Class rdf:ID="BusinessDocument">
  <rdfs:subClassOf>
    <owl:Restriction>
      <owl:onProperty rdf:resource="#BusinessDocumentName"/>
      <owl:cardinality rdf:datatype="&xsd;int">1</owl:cardinality>
    </owl:Restriction>
  </rdfs:subClassOf>
  <rdfs:subClassOf rdf:resource="&owl;Thing"/>
  <rdfs:comment rdf:datatype="&xsd;string"
```

```
        >The set of information components that are interchanged between business
process tasks, or as part of a business process task.

A business document represents a structured collection of information items.

Examples: Invoice, Order.</rdfs:comment>
  </owl:Class>
  <owl:ObjectProperty rdf:ID="BusinessDocumentAuthor">
    <rdf:type rdf:resource="&owl;InverseFunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessDocument"/>
    <rdfs:range rdf:resource="#Personnel"/>
    <owl:inverseOf rdf:resource="#AuthorofBusinessDocument"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="BusinessDocumentDescription">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessDocument"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="BusinessDocumentName">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessDocument"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="BusinessDocumentSubject">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessDocument"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="BusinessDocumentVersion">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessDocument"/>
    <rdfs:range rdf:resource="&xsd;float"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="BusinessPersonRole">
    <rdfs:subClassOf rdf:resource="#PersonRole"/>
  </owl:Class>
  <OS:BusinessPersonRole rdf:ID="BusinessPersonRole1">
    <OS:RoleDescription rdf:datatype="&xsd;string"
      >A specialist in Marketing.Where the solution has an external element,it is
important to consider how to make it attractive to external ppl and bodies
concerned.In particular with e-solutions such considerations will form a fundamental
part of the design of a solution rather than just an exercise following the completion
of the solution.</OS:RoleDescription>
    <OS:RoleName rdf:datatype="&xsd;string"
      >MarketingSpecialist</OS:RoleName>
    <OS:assignedtoJobTitle rdf:resource="#JobTitle3"/>
  </OS:BusinessPersonRole>
  <OS:BusinessPersonRole rdf:ID="BusinessPersonRole2">
    <OS:RoleDescription rdf:datatype="&xsd;string"
      >A specialist in identifying issues,requirements and solutions regarding
organisational change,ie.e corporate or individual rational,political and emotional
factors in bringing about th organisational change.</OS:RoleDescription>
    <OS:RoleName rdf:datatype="&xsd;string"
      >OrganisationalChange Manager</OS:RoleName>
  </OS:BusinessPersonRole>
  <OS:BusinessPersonRole rdf:ID="BusinessPersonRole3">
    <OS:RoleName rdf:datatype="&xsd;string"
      >MarketingManager</OS:RoleName>
    <OS:assignedtoJobTitle rdf:resource="#JobTitle1"/>
  </OS:BusinessPersonRole>
  <OS:BusinessPersonRole rdf:ID="BusinessPersonRole4">
    <OS:RoleDescription rdf:datatype="&xsd;string"
      >The Person  within the organisation with overall control,authority and
accountability for any given business process.</OS:RoleDescription>
    <OS:RoleName rdf:datatype="&xsd;string">ProcessOwner</OS:RoleName>
    <OS:belongstosystemRole rdf:resource="#SystemRole1"/>
  </OS:BusinessPersonRole>
  <OS:BusinessPersonRole rdf:ID="BusinessPersonRole5">
    <OS:RoleDescription rdf:datatype="&xsd;string"
      >The Person who saw a need for change and had the authoruty to make
something happen.They amy be several sponsors who collectively have this role.It
may be even higher authority and support is required such that others should also be
drwan into this role.</OS:RoleDescription>
    <OS:RoleName rdf:datatype="&xsd;string">ProjectSponsors</OS:RoleName>
    <OS:belongstosystemRole rdf:resource="#SystemRole1"/>
  </OS:BusinessPersonRole>
  <owl:DatatypeProperty rdf:ID="CompanyName">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseCustomer"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="consistsofActivity">
    <rdfs:domain rdf:resource="#Task"/>
  </owl:ObjectProperty>
  <owl:Class rdf:ID="Contract">
    <rdfs:subClassOf rdf:resource="#Non-Exempt"/>
  </owl:Class>
  <owl:Class rdf:ID="Customer">
    <rdfs:subClassOf rdf:resource="&owl;Thing"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#CustomerName"/>
        <owl:cardinality rdf:datatype="&xsd;int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:comment rdf:datatype="&xsd;string"
      >The persons or group that are the direct beneficiaries of a project or service -
the people for whom the project is being undertaken. (Indirect beneficiaries are
probably stakeholders.) If the persons or group are internal within your company,
they are referred as &quot;clients&quot;. If they are external, they are referred as
&quot;customers&quot;.</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="Customeraddress">
    <rdfs:domain rdf:resource="#Customer"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="CustomerDescription">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Customer"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="Customeremail">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Customer"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="CustomerFaxno">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Customer"/>
    <rdfs:range rdf:resource="&xsd;int"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="CustomerName">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Customer"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="CustomerPhoneno">
    <rdfs:domain rdf:resource="#Customer"/>
    <rdfs:range rdf:resource="&xsd;int"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="CustomerWebsite">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Customer"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <OS:BusinessPersonRole rdf:ID="DeliveryManager">
    <OS:RoleDescription rdf:datatype="&xsd;string"
```

```
        >Looks after project management and delivery process functions,for a given
project.</OS:RoleDescription>
  </OS:BusinessPersonRole>
  <owl:Class rdf:ID="Department">
    <rdfs:subClassOf rdf:resource="#OrganisationUnit"/>
  </owl:Class>
  <OS:Department rdf:ID="Department1"/>
  <OS:Department rdf:ID="Department2"/>
  <OS:JobTitle rdf:ID="DPM">
    <OS:jobtitleName rdf:datatype="&xsd;string">PM</OS:jobtitleName>
    <OS:jobtitleDeletionTimestamp rdf:datatype="&xsd;dateTime"
      >2006-11-02T00:00:00</OS:jobtitleDeletionTimestamp>
    <OS:hasRole rdf:resource="#DeliveryManager"/>
  </OS:JobT[illegible]>
  <owl:Class rdf:ID="DynamicPartnerRole">
    <rdfs:subClassOf rdf:resource="#PartnerRole"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >The partner role may be dynamically assigned in the context of a business
collaboration (e.g. a business partner may play the role of a customer in one business
transaction, and the role of a supplier in another one).</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="Employee">
    <rdfs:subClassOf rdf:resource="#Personnel"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >An Employee is on the payroll of the organization.</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="employeePersonnelID">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Employee"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="EndDate">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Non-Employee"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="EnterpriseCustomer">
    <rdfs:subClassOf rdf:resource="#External"/>
  </owl:Class>
  <OS:EnterpriseCustomer rdf:ID="EnterpriseCustomers1">
    <OS:SizeofCompany rdf:datatype="&xsd;int">500</OS:SizeofCompany>
    <OS:CustomerWebsite rdf:datatype="&xsd;string"
      >www.techsoft.com</OS:CustomerWebsite>
    <OS:CompanyName rdf:datatype="&xsd;string"
      >Techsoft Solutions</OS:CompanyName>
    <OS:CustomerDescription rdf:datatype="&xsd;string"
```

```
        >TechSoft solutions is a enterprise Customer ,with primary business between
us ,is Compuet Hardware Sales.</OS:CustomerDescription>
      <OS:CustomerName rdf:datatype="&xsd;string"
        >Techsoft Solutions</OS:CustomerName>
      <OS:Customeremail rdf:datatype="&xsd;string"
        >techsoftcontact@techsoft.com</OS:Customeremail>
    </OS:EnterpriseCustomer>
    <OS:EnterprisePartners rdf:ID="EnterprisePartner1"/>
    <owl:Class rdf:ID="EnterprisePartners">
      <rdfs:subClassOf rdf:resource="#Partner"/>
    </owl:Class>
    <owl:Class rdf:ID="Establishment">
      <rdfs:subClassOf rdf:resource="#OrganisationUnit"/>
    </owl:Class>
    <OS:Establishment rdf:ID="Establishment1">
      <OS:organisationUnitModificationTimestamp rdf:datatype="&xsd;dateTime"
        >2006-09-04T00:00:00</OS:organisationUnitModificationTimestamp>
    </OS:Establishment>
    <owl:ObjectProperty rdf:ID="executesActivitySpecification">
      <rdf:type rdf:resource="&owl;FunctionalProperty"/>
      <rdfs:domain rdf:resource="#JobTitle"/>
    </owl:ObjectProperty>
    <owl:Class rdf:ID="Exempt">
      <rdfs:subClassOf rdf:resource="#Employee"/>
      <rdfs:comment rdf:datatype="&xsd;string"
        >Exempt employees are salaried and are not eligible to earn
overtime.</rdfs:comment>
    </owl:Class>
    <owl:Class rdf:ID="External">
      <rdfs:subClassOf rdf:resource="#Customer"/>
      <rdfs:comment rdf:datatype="&xsd;string"
        >Individuals or Organisations tha recieve a good or service on return for
compnsation(typically monetary).Like Suppliers,bankers,competitors
etc.</rdfs:comment>
    </owl:Class>
    <owl:DatatypeProperty rdf:ID="firstname">
      <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
    <owl:Class rdf:ID="Full-Time">
      <rdfs:subClassOf rdf:resource="#Permanent"/>
    </owl:Class>
    <OS:Full-Time rdf:ID="Full-Time1">
      <OS:lastname rdf:datatype="&xsd;string">Ledger</OS:lastname>
      <OS:gender rdf:datatype="&xsd;string">Male</OS:gender>
      <OS:PersonnelDeletiontimestamp rdf:datatype="&xsd;dateTime"
        >2006-09-04T00:00:00</OS:PersonnelDeletiontimestamp>
      <OS:resourceDeletionTimestamp rdf:datatype="&xsd;dateTime"
        >2006-09-04T00:00:00</OS:resourceDeletionTimestamp>
      <OS:hasJobTitle rdf:resource="#JobTitle1"/>
    </OS:Full-Time>
    <OS:Full-Time rdf:ID="Full-Time2">
      <OS:lastname rdf:datatype="&xsd;string">Smiths</OS:lastname>
      <OS:gender rdf:datatype="&xsd;string">Female</OS:gender>
      <OS:PersonnelModificationtimestamp rdf:datatype="&xsd;dateTime"
        >2006-09-04T00:00:00</OS:PersonnelModificationtimestamp>
      <OS:resourceCreationTimestamp rdf:datatype="&xsd;dateTime"
        >2006-09-04T00:00:00</OS:resourceCreationTimestamp>
      <OS:PersonnelCreationtimestamp rdf:datatype="&xsd;dateTime"
        >2006-09-04T00:00:00</OS:PersonnelCreationtimestamp>
      <OS:hasJobTitle rdf:resource="#JobTitle3"/>
    </OS:Full-Time>
    <owl:DatatypeProperty rdf:ID="gender">
      <rdfs:domain rdf:resource="#Personnel"/>
      <rdfs:range>
        <owl:DataRange>
          <owl:oneOf>
            <rdf:List>
              <rdf:first rdf:datatype="&xsd;string">Male</rdf:first>
              <rdf:rest>
                <rdf:List>
                  <rdf:first rdf:datatype="&xsd;string">Female</rdf:first>
                  <rdf:rest rdf:resource="&rdf;nil"/>
                </rdf:List>
              </rdf:rest>
            </rdf:List>
          </owl:oneOf>
        </owl:DataRange>
      </rdfs:range>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="generates">
      <rdfs:domain rdf:resource="#Customer"/>
    </owl:ObjectProperty>
    <owl:Class rdf:ID="GenericBusinessDocument">
      <rdfs:subClassOf rdf:resource="#BusinessDocument"/>
    </owl:Class>
    <OS:GenericBusinessDocument rdf:ID="GenericBusinessDocument1">
      <OS:maintenanceRelease rdf:datatype="&xsd;string">July 21st
2006</OS:maintenanceRelease>
      <OS:minorRelease rdf:datatype="&xsd;string">March 1st
2006</OS:minorRelease>
      <OS:majorRelease rdf:datatype="&xsd;string">June 20th
2006</OS:majorRelease>
```

```
    <OS:BusinessDocumentVersion
rdf:datatype="&xsd;float">1.0</OS:BusinessDocumentVersion>
    <OS:BusinessDocumentDescription rdf:datatype="&xsd;string"
      >Business Unit implementation Process Flow
Document</OS:BusinessDocumentDescription>
    <OS:BusinessDocumentSubject rdf:datatype="&xsd;string"
      >New Business Unit -Phase1</OS:BusinessDocumentSubject>
    <OS:BusinessDocumentName rdf:datatype="&xsd;string">BU-
1</OS:BusinessDocumentName>
    <OS:BusinessDocumentAuthor rdf:resource="#Part-Time1"/>
  </OS:GenericBusinessDocument>
  <OS:Task rdf:ID="HardwareUpdate">
    <OS:taskName rdf:datatype="&xsd;string">HWUpdate</OS:taskName>
    <OS:taskCreationTimestamp rdf:datatype="&xsd;dateTime"
      >2006-11-02T00:00:00</OS:taskCreationTimestamp>
    <OS:performedByJobTitle rdf:resource="#ITArchitect"/>
    <OS:performedByOrgunit rdf:resource="#AMS"/>
  </OS:Task>
  <owl:ObjectProperty rdf:ID="hasJobTitle">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Employee"/>
    <rdfs:range rdf:resource="#JobTitle"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasLocation">
    <rdfs:domain rdf:resource="#Establishment"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasOrganisationChart">
    <rdfs:domain rdf:resource="#Organisation"/>
    <rdfs:range rdf:resource="#OrganisationChart"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasPartnerRole">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Partner"/>
    <rdfs:range rdf:resource="#PartnerRole"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasPriviledge">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:range rdf:resource="#Priviledge"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasRole">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#JobTitle"/>
    <rdfs:range rdf:resource="#Role"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasrole">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#JobTitle"/>
  <rdfs:range rdf:resource="#Role"/>
</owl:ObjectProperty>
<swrl:Imp rdf:ID="Rule-1">
  <swrl:head>
    <rdf:List>
      <rdf:first>
        <rdf:Description>
          <rdf:type rdf:resource="&swrl;DatavaluedPropertyAtom"/>
          <swrl:argument2 rdf:resource="#x3"/>
          <swrl:argument1 rdf:resource="#x1"/>
          <swrl:propertyPredicate rdf:resource="#hasroledescription"/>
        </rdf:Description>
      </rdf:first>
      <rdf:rest rdf:resource="&rdf;nil"/>
    </rdf:List>
  </swrl:head>
  <swrl:body>
    <rdf:List>
      <rdf:first>
        <rdf:Description>
          <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
          <swrl:argument2 rdf:resource="#x2"/>
          <swrl:argument1 rdf:resource="#x1"/>
          <swrl:propertyPredicate rdf:resource="#hasrole"/>
        </rdf:Description>
      </rdf:first>
      <rdf:rest>
        <rdf:List>
          <rdf:first>
            <rdf:Description>
              <rdf:type rdf:resource="&swrl;DatavaluedPropertyAtom"/>
              <swrl:argument2 rdf:resource="#x3"/>
              <swrl:argument1 rdf:resource="#x2"/>
              <swrl:propertyPredicate rdf:resource="#RoleDescription"/>
            </rdf:Description>
          </rdf:first>
          <rdf:rest rdf:resource="&rdf;nil"/>
        </rdf:List>
      </rdf:rest>
    </rdf:List>
  </swrl:body>
</swrl:Imp>
<owl:DatatypeProperty rdf:ID="hasroledescription">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#JobTitle"/>
```

```
      <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="holdsauthority">
      <rdfs:domain rdf:resource="#Personnel"/>
    </owl:ObjectProperty>
    <owl:Class rdf:ID="HumanResource">
      <rdfs:subClassOf rdf:resource="#Resource"/>
      <rdfs:comment rdf:datatype="&xsd;string"
        >A natural person is a human resource, which is capable to perform certain
activities.</rdfs:comment>
    </owl:Class>
    <owl:ObjectProperty rdf:ID="includesPersonnel">
      <rdfs:domain rdf:resource="#Workgroup"/>
      <rdfs:range rdf:resource="#Personnel"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="includespersonnel">
      <rdfs:domain rdf:resource="#HumanResource"/>
      <rdfs:range rdf:resource="#Personnel"/>
      <owl:inverseOf rdf:resource="#belongstoResource"/>
    </owl:ObjectProperty>
    <OS:IndividualPartners rdf:ID="IndividualPartner1"/>
    <owl:Class rdf:ID="IndividualPartners">
      <rdfs:subClassOf rdf:resource="#Partner"/>
    </owl:Class>
    <owl:Class rdf:ID="IndividualsCustomer">
      <rdfs:subClassOf rdf:resource="#External"/>
    </owl:Class>
    <OS:IndividualsCustomer rdf:ID="IndividualsCustomers1">
      <OS:CustomerWebsite rdf:datatype="&xsd;string"
        >www.myapgeted.com</OS:CustomerWebsite>
      <OS:Customeraddress rdf:datatype="&xsd;string"></OS:Customeraddress>
      <OS:CustomerPhoneno rdf:datatype="&xsd;int">0</OS:CustomerPhoneno>
      <OS:CustomerDescription rdf:datatype="&xsd;string"
        >Individual Reseller</OS:CustomerDescription>
      <OS:CustomerName rdf:datatype="&xsd;string">Tedd
Mersk</OS:CustomerName>
      <OS:Customeremail
rdf:datatype="&xsd;string">tedd@telus.net</OS:Customeremail>
    </OS:IndividualsCustomer>
    <owl:Class rdf:ID="Internal">
      <rdfs:subClassOf rdf:resource="#Customer"/>
      <rdfs:comment rdf:datatype="&xsd;string"
        >People working in different departments and branches of an
Organisation.Individuals or departments within an organisation taht recieve a good or
service from another individual/department in the organisation.</rdfs:comment>
    </owl:Class>
```

```
<OS:Internal rdf:ID="Internal1">
  <OS:CustomerWebsite rdf:datatype="&xsd;string"
    >www.it.techbridge.ca</OS:CustomerWebsite>
  <OS:CustomerName rdf:datatype="&xsd;string"
    >IT Specialist-00234</OS:CustomerName>
</OS:Internal>
<owl:ObjectProperty rdf:ID="isaTypeof">
  <rdfs:domain rdf:resource="#Customer"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isatypeof">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#OrganisationUnit"/>
  <rdfs:range rdf:resource="#Internal"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isresponsiblefor">
  <rdfs:domain rdf:resource="#OrganisationUnit"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isusedbyActivity">
  <rdfs:domain rdf:resource="#Resource"/>
</owl:ObjectProperty>
<OS:JobTitle rdf:ID="ITArchitect"/>
<owl:Class rdf:ID="ITPersonRole">
  <rdfs:subClassOf rdf:resource="#PersonRole"/>
</owl:Class>
<OS:ITPersonRole rdf:ID="ITPersonRole1">
  <OS:RoleName rdf:datatype="&xsd;string"
    >Solution Designer</OS:RoleName>
  <OS:assignedtoJobTitle rdf:resource="#JobTitle2"/>
</OS:ITPersonRole>
<OS:ITPersonRole rdf:ID="ITPersonRole2">
  <OS:RoleDescription rdf:datatype="&xsd;string"
    >A specialist in the design and construction of networking and
telecommunications.They would deal with internal and external networking
issues.</OS:RoleDescription>
  <OS:RoleName rdf:datatype="&xsd;string"
    >NetworkSpecialist</OS:RoleName>
</OS:ITPersonRole>
<owl:Class rdf:ID="JobTitle">
  <rdfs:subClassOf rdf:resource="&owl;Thing"/>
  <rdfs:subClassOf>
    <owl:Restriction>
      <owl:onProperty rdf:resource="#jobtitleName"/>
      <owl:cardinality rdf:datatype="&xsd;int">1</owl:cardinality>
    </owl:Restriction>
  </rdfs:subClassOf>
  <rdfs:subClassOf>
```

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      <owl:Restriction>
        <owl:onProperty rdf:resource="#JobTitlereferencesPriviledge"/>
        <owl:minCardinality rdf:datatype="&xsd;int">1</owl:minCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:comment rdf:datatype="&xsd;string"
      >A Job Title is a generic description of a job.It is an official position in an
organisation heirarchy.A name that reflects a persons authority and
responsibility.</rdfs:comment>
  </owl:Class>
  <OS:JobTitle rdf:ID="JobTitle1">
    <OS:jobtitleCreationTimestamp rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</OS:jobtitleCreationTimestamp>
    <OS:jobtitleName rdf:datatype="&xsd;string">Manager</OS:jobtitleName>
    <OS:jobtitleDeletionTimestamp rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</OS:jobtitleDeletionTimestamp>
    <OS:jobtitleModificationTimestamp rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</OS:jobtitleModificationTimestamp>
    <OS:performstask rdf:resource="#Task5"/>
    <OS:hasRole rdf:resource="#BusinessPersonRole3"/>
    <OS:assignedToPersonnel rdf:resource="#Full-Time1"/>
  </OS:JobTitle>
  <OS:JobTitle rdf:ID="JobTitle2">
    <OS:jobtitleCreationTimestamp rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</OS:jobtitleCreationTimestamp>
    <OS:jobtitleName rdf:datatype="&xsd;string"
      >TechnicalConsultant</OS:jobtitleName>
    <OS:jobtitleDeletionTimestamp rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</OS:jobtitleDeletionTimestamp>
  </OS:JobTitle>
  <OS:JobTitle rdf:ID="JobTitle3">
    <OS:jobtitleName rdf:datatype="&xsd;string">SalesPerson</OS:jobtitleName>
  </OS:JobTitle>
  <owl:DatatypeProperty rdf:ID="jobtitleCreationTimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#JobTitle"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="jobtitleDeletionTimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#JobTitle"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="jobTitleDescription">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#JobTitle"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="jobtitleModificationTimestamp">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#JobTitle"/>
  <rdfs:range rdf:resource="&xsd;dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="jobtitleName">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#JobTitle"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="JobTitlereferencesPriviledge">
  <rdfs:domain rdf:resource="#JobTitle"/>
  <rdfs:range rdf:resource="#Priviledge"/>
  <owl:inverseOf rdf:resource="#referencedByJobTitle"/>
</owl:ObjectProperty>
<owl:DatatypeProperty rdf:ID="lastname">
  <rdfs:domain rdf:resource="#Personnel"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="Long-Term">
  <rdfs:subClassOf rdf:resource="#Contract"/>
</owl:Class>
<owl:DatatypeProperty rdf:ID="maintenanceRelease">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessDocument"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="majorRelease">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessDocument"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="managesOrgUnit">
  <rdfs:domain rdf:resource="#Personnel"/>
  <rdfs:range rdf:resource="#OrganisationUnit"/>
</owl:ObjectProperty>
<owl:DatatypeProperty rdf:ID="middlename">
  <rdfs:domain rdf:resource="#Personnel"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="minorRelease">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessDocument"/>
  <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="MultipartyCollaboration">
    <rdfs:subClassOf rdf:resource="#DynamicPartnerRole"/>
  </owl:Class>
  <owl:Class rdf:ID="Non-Employee">
    <rdfs:subClassOf rdf:resource="#Personnel"/>
    <rdfs:comment rdf:datatype="&xsd;string"
        >A Non-Employee is not on the payroll of the organization.</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="Non-EmployeeID">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Non-Employee"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="Non-Exempt">
    <rdfs:subClassOf rdf:resource="#Employee"/>
    <rdfs:comment rdf:datatype="&xsd;string"
        >Non Exempt Employees are not salaried but have hourly pay and are eligible
to earn overtime.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="Non-HumanResource">
    <rdfs:subClassOf rdf:resource="#Resource"/>
    <rdfs:comment rdf:datatype="&xsd;string"
        >A Non-Human Resource is a collective term, which includes various kinds
of non-human resources, such as equipment, offices, materials, etc.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="Non-PhysicalResource">
    <rdfs:subClassOf rdf:resource="#Non-HumanResource"/>
    <rdfs:comment rdf:datatype="&xsd;string"
        >A non-physical resource is not tangible.</rdfs:comment>
  </owl:Class>
  <owl:ObjectProperty rdf:ID="ObjectProperty_96"/>
  <owl:Class rdf:ID="Organisation">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#organisationName"/>
        <owl:cardinality rdf:datatype="&xsd;int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf rdf:resource="&owl;Thing"/>
    <rdfs:comment rdf:datatype="&xsd;string"
        >An organization is a commercial, academic, nonprofit, government, or
military entity. It consists of individuals who work together toward common
goals.</rdfs:comment>
  </owl:Class>
  <OS:Organisation rdf:ID="Organisation1">
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      <OS:organisationDescription rdf:datatype="&xsd;string"
         >Techbridge Solutions provides Hardware and Software ,Products and
Solutions.</OS:organisationDescription>
      <OS:organisationModificationTimestamp rdf:datatype="&xsd;dateTime"
         >2006-09-29T00:00:00</OS:organisationModificationTimestamp>
      <OS:organisationDeletionTimestamp rdf:datatype="&xsd;dateTime"
         >2119-09-04T00:00:00</OS:organisationDeletionTimestamp>
      <OS:organisationCreationTimsstamp rdf:datatype="&xsd;dateTime"
         >2006-09-04T00:00:00</OS:organisationCreationTimsstamp>
      <OS:organisationName rdf:datatype="&xsd;string"
         >TechBridge Enterprise</OS:organisationName>
      <OS:hasOrganisationChart rdf:resource="#OrganisationChart1"/>
    </OS:Organisation>
    <owl:Class rdf:ID="OrganisationChart">
      <rdfs:subClassOf rdf:resource="&owl;Thing"/>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#referencesOrganisation"/>
          <owl:cardinality rdf:datatype="&xsd;int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#organisationChartName"/>
          <owl:cardinality rdf:datatype="&xsd;int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:comment rdf:datatype="&xsd;string"
         >A chart showing the lines of responsibility between organization units of an
organization.</rdfs:comment>
    </owl:Class>
    <OS:OrganisationChart rdf:ID="OrganisationChart1">
      <OS:organisationChartName
rdf:datatype="&xsd;string">RoleChart</OS:organisationChartName>
      <OS:organisationChartDescription rdf:datatype="&xsd;string"
         >Describes the roles and Hierarchy in the
organisation.</OS:organisationChartDescription>
      <OS:organisationChartModificationTimestamp rdf:datatype="&xsd;dateTime"
         >2007-09-04T00:00:00</OS:organisationChartModificationTimestamp>
      <OS:organisationChartCreationTimestamp rdf:datatype="&xsd;dateTime"
         >2006-09-04T00:00:00</OS:organisationChartCreationTimestamp>
      <OS:organisationChartDeletionTimestamp rdf:datatype="&xsd;dateTime"
         >2010-09-04T00:00:00</OS:organisationChartDeletionTimestamp>
      <OS:referencesOrganisation rdf:resource="#Organisation1"/>
    </OS:OrganisationChart>
    <owl:DatatypeProperty rdf:ID="organisationChartCreationTimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#OrganisationChart"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="organisationChartDeletionTimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#OrganisationChart"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="organisationChartDescription">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#OrganisationChart"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="organisationChartModificationTimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#OrganisationChart"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="organisationChartName">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#OrganisationChart"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="organisationCreationTimsstamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Organisation"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="organisationDeletionTimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Organisation"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="organisationDescription">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Organisation"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="organisationModificationTimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Organisation"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="organisationName">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
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      <rdfs:domain rdf:resource="#Organisation"/>
      <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
    <owl:Class rdf:ID="OrganisationUnit">
      <rdfs:subClassOf rdf:resource="&owl;Thing"/>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#organisationUnitName"/>
          <owl:cardinality rdf:datatype="&xsd;int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#organisationUnitManager"/>
          <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:comment rdf:datatype="&xsd;string"
        >Administrative unit of an organization. Each child organization unit can have
one parent organization unit.</rdfs:comment>
    </owl:Class>
    <owl:DatatypeProperty rdf:ID="organisationUnitCreationTimestamp">
      <rdf:type rdf:resource="&owl;FunctionalProperty"/>
      <rdfs:domain rdf:resource="#OrganisationUnit"/>
      <rdfs:range rdf:resource="&xsd;dateTime"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="organisationUnitDeletionTimestamp">
      <rdf:type rdf:resource="&owl;FunctionalProperty"/>
      <rdfs:domain rdf:resource="#OrganisationUnit"/>
      <rdfs:range rdf:resource="&xsd;dateTime"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="organisationUnitManager">
      <rdf:type rdf:resource="&owl;FunctionalProperty"/>
      <rdfs:domain rdf:resource="#OrganisationUnit"/>
      <rdfs:range rdf:resource="#Employee"/>
    </owl:ObjectProperty>
    <owl:DatatypeProperty rdf:ID="organisationUnitModificationTimestamp">
      <rdf:type rdf:resource="&owl;FunctionalProperty"/>
      <rdfs:domain rdf:resource="#OrganisationUnit"/>
      <rdfs:range rdf:resource="&xsd;dateTime"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="organisationUnitName">
      <rdf:type rdf:resource="&owl;FunctionalProperty"/>
      <rdfs:domain rdf:resource="#OrganisationUnit"/>
      <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
```

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  <owl:Class rdf:ID="Part-Time">
    <rdfs:subClassOf rdf:resource="#Permanent"/>
  </owl:Class>
  <OS:Part-Time rdf:ID="Part-Time1">
    <OS:lastname rdf:datatype="&xsd;string">Watkins</OS:lastname>
    <OS:gender rdf:datatype="&xsd;string">Female</OS:gender>
    <OS:PersonnelDeletiontimestamp rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</OS:PersonnelDeletiontimestamp>
    <OS:resourceDeletionTimestamp rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</OS:resourceDeletionTimestamp>
    <OS:resourceModificationTimestamp rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</OS:resourceModificationTimestamp>
    <OS:PersonnelCreationtimestamp rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</OS:PersonnelCreationtimestamp>
    <OS:hasJobTitle rdf:resource="#JobTitle2"/>
    <OS:AuthorofBusinessDocument
rdf:resource="#GenericBusinessDocument1"/>
  </OS:Part-Time>
  <owl:Class rdf:ID="Partner"/>
  <owl:DatatypeProperty rdf:ID="PartnerContactaddress">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Partner"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="PartnerDescription">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Partner"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="PartnerLoginPassword">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Partner"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="PartnerloginUsername">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Partner"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="PartnerName">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Partner"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="PartnerPhoneNumber">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Partner"/>
    <rdfs:range rdf:resource="&xsd;int"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="PartnerRole">
    <rdfs:subClassOf rdf:resource="#Role"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >A business partner can assume multiple roles in a business relationship (e.g.
customer, supplier).</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="PartnerType">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Partner"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="performedByJobTitle">
    <rdfs:domain rdf:resource="#Task"/>
    <rdfs:range rdf:resource="#JobTitle"/>
  </owl:ObjectProperty>
  <swrl:Imp rdf:ID="Rule-2">
    <swrl:head>
      <rdf:List>
        <rdf:first>
          <rdf:Description>
            <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
            <swrl:argument2 rdf:resource="#x3"/>
            <swrl:argument1 rdf:resource="#x2"/>
            <swrl:propertyPredicate rdf:resource="#belongstoOrgUnit"/>
          </rdf:Description>
        </rdf:first>
        <rdf:rest rdf:resource="&rdf;nil"/>
      </rdf:List>
    </swrl:head>
    <swrl:body>
      <rdf:List>
        <rdf:first>
          <rdf:Description>
            <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
            <swrl:argument2 rdf:resource="#x2"/>
            <swrl:argument1 rdf:resource="#x1"/>
            <swrl:propertyPredicate rdf:resource="#performedByJobTitle"/>
          </rdf:Description>
        </rdf:first>
        <rdf:rest>
          <rdf:List>
            <rdf:first>
              <rdf:Description>
```

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                <rdf:type rdf:resource="&swrl;IndividualPropertyAtom"/>
                <swrl:argument2 rdf:resource="#x3"/>
                <swrl:argument1 rdf:resource="#x1"/>
                <swrl:propertyPredicate rdf:resource="#performedByOrgunit"/>
              </rdf:Description>
            </rdf:first>
            <rdf:rest rdf:resource="&rdf;nil"/>
          </rdf:List>
        </rdf:rest>
      </rdf:List>
    </swrl:body>
  </swrl:Imp>
  <owl:ObjectProperty rdf:ID="performedByOrgunit">
    <rdfs:domain rdf:resource="#Task"/>
    <rdfs:range rdf:resource="#OrganisationUnit"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="performsActivity">
    <rdfs:domain rdf:resource="#OrganisationUnit"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="performsactivity">
    <rdfs:domain rdf:resource="#Personnel"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="performsTask">
    <rdfs:domain rdf:resource="#OrganisationUnit"/>
    <rdfs:range rdf:resource="#Task"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="performstask">
    <rdfs:domain rdf:resource="#JobTitle"/>
    <rdfs:range rdf:resource="#Task"/>
  </owl:ObjectProperty>
  <owl:Class rdf:ID="Permanent">
    <rdfs:subClassOf rdf:resource="#Exempt"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >Permanent employees ahve gaurenteed salaries</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="PermanentPhysicalResource">
    <rdfs:subClassOf rdf:resource="#PhysicalResource"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >A permanent resource is unrestrictedly available at all
times.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="Personnel">
    <rdfs:subClassOf rdf:resource="#HumanResource"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#lastname"/>
        <owl:cardinality rdf:datatype="&xsd;int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#gender"/>
        <owl:cardinality rdf:datatype="&xsd;int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="PersonnelCreationtimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Personnel"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="PersonnelDeletiontimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Personnel"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="PersonnelDescription">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Personnel"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="PersonnelModificationtimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Personnel"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="PersonRole">
    <rdfs:subClassOf rdf:resource="#Role"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >A role that a person can assume is associated with certain qualifications,
skills and experiences. A role describes the part played by people in meeting their
objectives by working competently and flexibly within the context of
Organization objectives, structure and processes.

A person can assume multiple roles.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="PhysicalResource">
    <rdfs:subClassOf rdf:resource="#Non-HumanResource"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >A physical resource is tangible.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="Priviledge"/>
  <owl:ObjectProperty rdf:ID="referencedByJobTitle">
    <rdf:type rdf:resource="&owl;InverseFunctionalProperty"/>
    <rdfs:domain rdf:resource="#Priviledge"/>
    <rdfs:range rdf:resource="#JobTitle"/>
    <owl:inverseOf rdf:resource="#JobTitlereferencesPriviledge"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="referencedbyWorkgroup">
    <rdf:type rdf:resource="&owl;InverseFunctionalProperty"/>
    <rdfs:domain rdf:resource="#Priviledge"/>
    <rdfs:range rdf:resource="#Workgroup"/>
    <owl:inverseOf rdf:resource="#WorkgroupreferencesPriviledge"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="referencesOrganisation">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#OrganisationChart"/>
    <rdfs:range rdf:resource="#Organisation"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="RelatedDocument">
    <rdfs:domain rdf:resource="#BusinessDocument"/>
    <rdfs:range rdf:resource="#BusinessDocument"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="RenewDate">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Non-Employee"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="ReplacesDocument">
    <rdfs:domain rdf:resource="#BusinessDocument"/>
    <rdfs:range rdf:resource="#BusinessDocument"/>
  </owl:ObjectProperty>
  <owl:Class rdf:ID="Resource">
    <rdfs:comment rdf:datatype="&xsd;string"
        >A source of supply or support, i.e. an available means.A resource can be a
Labor.capital,purchased services,proprietary s/w,Land,Raw
amterial,machines,facility,euipment etc.</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="resourceCreationTimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Resource"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="resourceDeletionTimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Resource"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
```

```
<owl:DatatypeProperty rdf:ID="resourceDescription">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#Resource"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="resourceModificationTimestamp">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#Resource"/>
  <rdfs:range rdf:resource="&xsd;dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="resourceName">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#Resource"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="RevisionHistory">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessDocument"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="Role">
  <rdfs:comment rdf:datatype="&xsd;string"
    >A role defines a functional entity.</rdfs:comment>
</owl:Class>
<owl:DatatypeProperty rdf:ID="RoleDescription">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#Role"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="RoleName">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#Role"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="Short-Term">
  <rdfs:subClassOf rdf:resource="#Contract"/>
</owl:Class>
<owl:DatatypeProperty rdf:ID="SizeofCompany">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#EnterpriseCustomer"/>
  <rdfs:range rdf:resource="&xsd;int"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="specificationLocation">
  <rdf:type rdf:resource="&owl;FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessDocument"/>
</owl:DatatypeProperty>
```

```
  <owl:ObjectProperty rdf:ID="stakeholderofBusinessArea">
    <rdfs:domain rdf:resource="#Personnel"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="stakeholderofBusinessDomain">
    <rdfs:domain rdf:resource="#Personnel"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="StartDate">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Non-Employee"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="StaticPartnerRole">
    <rdfs:subClassOf rdf:resource="#PartnerRole"/>
    <rdfs:comment rdf:datatype="&xsd;string"
        >A static partner role represents a non-transient relationship with a business
partner (e.g. customer, supplier).

A business partner may assume multiple roles (e.g. a business partner is a customer
and a supplier at the same time).</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="SystemRole">
    <rdfs:subClassOf rdf:resource="#Role"/>
    <rdfs:comment rdf:datatype="&xsd;string"
        >A system role is performed by some non-human entity (e.g. computer
system).</rdfs:comment>
  </owl:Class>
  <OS:SystemRole rdf:ID="SystemRole1">
    <OS:RoleDescription rdf:datatype="&xsd;string"
        >The group of ppl incharge of regular oevrsight of the project.Colelctively
they should represent all significant areas of participation in the project and they
should have authority to make decisions on behalf of those areas.Memebers would be
typically the department heads,directors with external represenatives as well.The
project director and the project manager would report to the project
board.</OS:RoleDescription>
    <OS:RoleName rdf:datatype="&xsd;string">ProjectBoard</OS:RoleName>
  </OS:SystemRole>
  <owl:Class rdf:ID="Task">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#taskName"/>
        <owl:cardinality rdf:datatype="&xsd;int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf rdf:resource="&owl;Thing"/>
    <rdfs:comment rdf:datatype="&xsd;string"
```

```
      >A Task is a unit of work, performed by a single role. It is defined from the
organizational perspective.

A task may or may not have already been defined as a Process Task Context Type
(process definition may happen much later in time).</rdfs:comment>
  </owl:Class>
  <OS:Task rdf:ID="Task1">
    <OS:taskName rdf:datatype="&xsd;string"
      >Management of Change</OS:taskName>
  </OS:Task>
  <OS:Task rdf:ID="Task2">
    <OS:taskName rdf:datatype="&xsd;string"
      >InventoryTracking</OS:taskName>
    <OS:taskCreationTimestamp rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</OS:taskCreationTimestamp>
  </OS:Task>
  <OS:Task rdf:ID="Task3">
    <OS:taskName rdf:datatype="&xsd;string"
      >SalesRequirement analysis</OS:taskName>
  </OS:Task>
  <OS:Task rdf:ID="Task4">
    <OS:taskName rdf:datatype="&xsd;string"
      >Create SalesOrder</OS:taskName>
  </OS:Task>
  <OS:Task rdf:ID="Task5">
    <OS:taskName rdf:datatype="&xsd;string"
      >Manage_Sales_and_Promotions</OS:taskName>
    <OS:taskModificationTimestamp rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</OS:taskModificationTimestamp>
  </OS:Task>
  <owl:DatatypeProperty rdf:ID="taskCreationTimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Task"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="taskDeletionTimestamp">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Task"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="taskDescription">
    <rdf:type rdf:resource="&owl;FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Task"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="taskModificationTimestamp">
```

```
      <rdf:type rdf:resource="&owl;FunctionalProperty"/>
      <rdfs:domain rdf:resource="#Task"/>
      <rdfs:range rdf:resource="&xsd;dateTime"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="taskName">
      <rdf:type rdf:resource="&owl;FunctionalProperty"/>
      <rdfs:domain rdf:resource="#Task"/>
      <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
    <owl:Class rdf:ID="TemporalPhysicalResource">
      <rdfs:subClassOf rdf:resource="#PhysicalResource"/>
      <rdfs:comment rdf:datatype="&xsd;string"
        >A temporal resource is available during certain time periods
only.</rdfs:comment>
    </owl:Class>
    <owl:ObjectProperty rdf:ID="toperformActivity">
      <rdfs:domain rdf:resource="#Priviledge"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="uses">
      <rdfs:domain rdf:resource="#Customer"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="waitsforBusinessArtifact">
      <rdfs:domain rdf:resource="#Internal"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="workfor">
      <rdfs:domain rdf:resource="#Non-Employee"/>
      <rdfs:range rdf:resource="#OrganisationUnit"/>
    </owl:ObjectProperty>
    <owl:Class rdf:ID="Workgroup">
      <rdfs:subClassOf rdf:resource="#OrganisationUnit"/>
    </owl:Class>
    <owl:ObjectProperty rdf:ID="WorkgrouppreferencesPriviledge">
      <rdf:type rdf:resource="&owl;FunctionalProperty"/>
      <rdfs:domain rdf:resource="#Workgroup"/>
      <rdfs:range rdf:resource="#Priviledge"/>
      <owl:inverseOf rdf:resource="#referencedbyWorkgroup"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="worksforOrgUnit">
      <rdfs:domain rdf:resource="#Employee"/>
      <rdfs:range rdf:resource="#OrganisationUnit"/>
    </owl:ObjectProperty>
  </rdf:RDF>
```

```
<?xml version="1.0"?>
<rdf:RDF xmlns="http://www.owl-ontologies.com/Ontology1160514425.owl#"
    xml:base="http://www.w3.org/2003/11/swrl"
    xmlns:p1="http://protege.stanford.edu/plugins/owl/protege#"
    xmlns:OS="http://www.owl-ontologies.com/Ontology1156787408.owl#"
    xmlns:swrlbImport="http://www.daml.org/rules/proposal/swrlb.owl#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:BC="http://www.owl-ontologies.com/core.owl#"

xmlns:UP="http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#"
    xmlns:p2="http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#"
    xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
    xmlns:swrlImport="http://www.daml.org/rules/proposal/swrl.owl#"
    xmlns:foaf="http://xmlns.com/foaf/0.1/"
    xmlns:vs="http://www.w3.org/2003/06/sw-vocab-status/ns#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:dcterms="http://purl.org/dc/terms/"
    xmlns:xsp="http://www.owl-ontologies.com/2005/08/07/xsp.owl#"
    xmlns:dc="http://purl.org/dc/elements/1.1/"
    xmlns:swrl="http://www.w3.org/2003/11/swrl#"
    xmlns:BP="http://www.owl-ontologies.com/BP.owl#"
    xmlns:daml="http://www.daml.org/2001/03/daml+oil#"
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:PO="http://www.owl-ontologies.com/Ontology1156283607.owl#">
   <owl:Ontology rdf:about="">
      <owl:versionInfo rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
         >$Id: swrl.owl,v 1.15 2004/11/09 11:58:28 mdean Exp $</owl:versionInfo>
      <owl:versionInfo rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
         >$Id: swrl.owl,v 1.15 2004/11/09 11:58:28 mdean Exp $</owl:versionInfo>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
         >OWL definition of the RDF Concrete Syntax for the Semantic Web Rule
Language</rdfs:comment>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
         >OWL definition of the RDF Concrete Syntax for the Semantic Web Rule
Language</rdfs:comment>
    </owl:Ontology>
    <owl:ObjectProperty rdf:ID="argument1"/>
    <rdf:Property rdf:ID="argument2">
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
         >can be a Literal or Resource</rdfs:comment>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
         >can be a Literal or Resource</rdfs:comment>
    </rdf:Property>
    <owl:ObjectProperty rdf:ID="arguments"/>
    <owl:Class rdf:ID="Atom">
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
         >common superclass</rdfs:comment>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
         >common superclass</rdfs:comment>
    </owl:Class>
    <owl:Class rdf:ID="AtomList">
      <rdfs:subClassOf rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#List"/>
      <rdfs:subClassOf>
         <owl:Restriction>
            <owl:onProperty rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#first"/>
            <owl:allValuesFrom rdf:resource="#Atom"/>
         </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
         <owl:Restriction>
```

```
        <owl:onProperty rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#first"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#rest"/>
        <owl:allValuesFrom rdf:resource="#AtomList"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#rest"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
  </owl:Class>
  <owl:ObjectProperty rdf:ID="body">
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >rule body (antecedent):  List of Atom</rdfs:comment>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >rule body (antecedent):  List of Atom</rdfs:comment>
  </owl:ObjectProperty>
  <owl:Class rdf:ID="Builtin"/>
  <owl:ObjectProperty rdf:ID="builtin"/>
  <owl:Class rdf:ID="BuiltinAtom">
    <rdfs:subClassOf rdf:resource="#Atom"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#builtin"/>
        <owl:allValuesFrom rdf:resource="#Builtin"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#builtin"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
```

```
      <owl:Restriction>
        <owl:onProperty rdf:resource="#arguments"/>
        <owl:allValuesFrom rdf:resource="http://www.w3.org/1999/02/22-rdf-
syntax-ns#List"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#arguments"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >consists of a builtin and a List of arguments</rdfs:comment>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >consists of a builtin and a List of arguments</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="ClassAtom">
    <rdfs:subClassOf rdf:resource="#Atom"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#classPredicate"/>
        <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#Class"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#classPredicate"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#argument1"/>
        <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#argument1"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
```

```
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >consists of a classPredicate and argument1</rdfs:comment>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >consists of a classPredicate and argument1</rdfs:comment>
    </owl:Class>
    <owl:ObjectProperty rdf:ID="classPredicate"/>
    <owl:ObjectProperty rdf:ID="dataRange"/>
    <owl:Class rdf:ID="DataRangeAtom">
      <rdfs:subClassOf rdf:resource="#Atom"/>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#dataRange"/>
          <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#DataRange"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#dataRange"/>
          <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#argument1"/>
          <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#argument1"/>
          <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >consists of a dataRange and argument1</rdfs:comment>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >consists of a dataRange and argument1</rdfs:comment>
    </owl:Class>
    <owl:Class rdf:ID="DatavaluedPropertyAtom">
      <rdfs:subClassOf rdf:resource="#Atom"/>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#propertyPredicate"/>
          <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#DatatypeProperty"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#propertyPredicate"/>
          <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#argument1"/>
          <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#argument1"/>
          <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#argument2"/>
          <owl:allValuesFrom rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Literal"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#argument2"/>
          <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >consists of a propertyPredicate (owl:DatatypeProperty), argument1
(owl:Thing), and argument2 (rdfs:Literal)</rdfs:comment>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
```

```
        >consists of a propertyPredicate (owl:DatatypeProperty), argument1
(owl:Thing), and argument2 (rdfs:Literal)</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="DifferentIndividualsAtom">
    <rdfs:subClassOf rdf:resource="#Atom"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#argument1"/>
        <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#argument1"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#argument2"/>
        <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#argument2"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >consists of argument1 (owl:Thing) and argument2
(owl:Thing)</rdfs:comment>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >consists of argument1 (owl:Thing) and argument2
(owl:Thing)</rdfs:comment>
  </owl:Class>
  <owl:ObjectProperty rdf:ID="head">
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >rule head (consequent):  List of Atom</rdfs:comment>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >rule head (consequent):  List of Atom</rdfs:comment>
  </owl:ObjectProperty>
  <owl:Class rdf:ID="Imp">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#head"/>
        <owl:allValuesFrom rdf:resource="#AtomList"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#head"/>
        <owl:maxCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#body"/>
        <owl:allValuesFrom rdf:resource="#AtomList"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#body"/>
        <owl:maxCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >implication (rule)</rdfs:comment>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >implication (rule)</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="IndividualPropertyAtom">
    <rdfs:subClassOf rdf:resource="#Atom"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#propertyPredicate"/>
        <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#ObjectProperty"/>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#propertyPredicate"/>
```

```
            <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
          </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
          <owl:Restriction>
            <owl:onProperty rdf:resource="#argument1"/>
            <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
          </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
          <owl:Restriction>
            <owl:onProperty rdf:resource="#argument1"/>
            <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
          </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
          <owl:Restriction>
            <owl:onProperty rdf:resource="#argument2"/>
            <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
          </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
          <owl:Restriction>
            <owl:onProperty rdf:resource="#argument2"/>
            <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
          </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >consists of a propertyPredicate (owl:ObjectProperty), argument1
(owl:Thing), and argument2 (owl:Thing)</rdfs:comment>
        <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >consists of a propertyPredicate (owl:ObjectProperty), argument1
(owl:Thing), and argument2 (owl:Thing)</rdfs:comment>
      </owl:Class>
      <owl:ObjectProperty rdf:ID="propertyPredicate"/>
      <owl:Class rdf:ID="SameIndividualAtom">
        <rdfs:subClassOf rdf:resource="#Atom"/>
        <rdfs:subClassOf>
          <owl:Restriction>
            <owl:onProperty rdf:resource="#argument1"/>
```

```xml
            <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
          </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
          <owl:Restriction>
            <owl:onProperty rdf:resource="#argument1"/>
            <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
          </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
          <owl:Restriction>
            <owl:onProperty rdf:resource="#argument2"/>
            <owl:allValuesFrom
rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
          </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
          <owl:Restriction>
            <owl:onProperty rdf:resource="#argument2"/>
            <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
          </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >consists of argument1 (owl:Thing) and argument2
(owl:Thing)</rdfs:comment>
        <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >consists of argument1 (owl:Thing) and argument2
(owl:Thing)</rdfs:comment>
    </owl:Class>
    <owl:Class rdf:ID="Variable">
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >indicate that a URI is being used as a variable</rdfs:comment>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >indicate that a URI is being used as a variable</rdfs:comment>
    </owl:Class>
</rdf:RDF>
```

```xml
<?xml version="1.0"?>
```

```
<rdf:RDF xmlns="http://www.owl-ontologies.com/Ontology1160514425.owl#"
    xml:base="http://www.w3.org/2003/11/swrlb"
    xmlns:p1="http://protege.stanford.edu/plugins/owl/protege#"
    xmlns:OS="http://www.owl-ontologies.com/Ontology1156787408.owl#"
    xmlns:swrlbImport="http://www.daml.org/rules/proposal/swrlb.owl#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:BC="http://www.owl-ontologies.com/core.owl#"

xmlns:UP="http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#"
    xmlns:p2="http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#"
    xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
    xmlns:swrlImport="http://www.daml.org/rules/proposal/swrl.owl#"
    xmlns:foaf="http://xmlns.com/foaf/0.1/"
    xmlns:vs="http://www.w3.org/2003/06/sw-vocab-status/ns#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:dcterms="http://purl.org/dc/terms/"
    xmlns:xsp="http://www.owl-ontologies.com/2005/08/07/xsp.owl#"
    xmlns:dc="http://purl.org/dc/elements/1.1/"
    xmlns:swrl="http://www.w3.org/2003/11/swrl#"
    xmlns:BP="http://www.owl-ontologies.com/BP.owl#"
    xmlns:daml="http://www.daml.org/2001/03/daml+oil#"
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:PO="http://www.owl-ontologies.com/Ontology1156283607.owl#">
    <owl:Ontology rdf:about=""/>
    <rdf:Description rdf:about="http://www.w3.org/2003/11/swrl#Builtin">
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="#args"/>
                <owl:allValuesFrom
rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="#args"/>
                <owl:maxCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:maxCardinality>
            </owl:Restriction>
        </rdfs:subClassOf>
        <rdfs:subClassOf>
            <owl:Restriction>
                <owl:onProperty rdf:resource="#minArgs"/>
                <owl:allValuesFrom
rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
            </owl:Restriction>
```

```
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#minArgs"/>
          <owl:maxCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:maxCardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#maxArgs"/>
          <owl:allValuesFrom
rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#maxArgs"/>
          <owl:maxCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:maxCardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
    </rdf:Description>
    <swrl:Builtin rdf:ID="abs">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="add">
      <swrlb:minArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:minArgs>
      <swrlb:minArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:minArgs>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="addDayTimeDurations">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="addDayTimeDurationToDate">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
```

```
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="addDayTimeDurationToDateTime">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="addDayTimeDurationToTime">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="addYearMonthDurations">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="addYearMonthDurationToDate">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="addYearMonthDurationToDateTime">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="anyURI">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">7</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">7</swrlb:args>
    </swrl:Builtin>
    <owl:DatatypeProperty rdf:ID="args"/>
    <swrl:Builtin rdf:ID="booleanNot">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="ceiling">
```

```
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="contains">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="containsIgnoreCase">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="cos">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="date">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">5</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">5</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="dateTime">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">8</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">8</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="dayTimeDuration">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">5</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">5</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="divide">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
```

```
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="divideDayTimeDuration">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="divideYearMonthDuration">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="empty">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="endsWith">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="equal">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="first">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="floor">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="greaterThan">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
```

```
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="greaterThanOrEqual">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="integerDivide">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="length">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="lessThan">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="lessThanOrEqual">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="listConcat">
        <swrlb:minArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:minArgs>
        <swrlb:minArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:minArgs>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="listIntersection">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="listSubtraction">
```

```
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="lowerCase">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="matches">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <owl:DatatypeProperty rdf:ID="maxArgs"/>
    <swrl:Builtin rdf:ID="member">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <owl:DatatypeProperty rdf:ID="minArgs"/>
    <swrl:Builtin rdf:ID="mod">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="multiply">
        <swrlb:minArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:minArgs>
        <swrlb:minArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:minArgs>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="multiplyDayTimeDuration">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="multiplyYearMonthDuration">
        <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
```

```
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="normalizeSpace">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="notEqual">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="pow">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="replace">
      <swrlb:args
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      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">4</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="resolveURI">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="rest">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="round">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
   </swrl:Builtin>
   <swrl:Builtin rdf:ID="roundHalfToEven">
```

```
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="sin">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="startsWith">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="stringConcat">
      <swrlb:minArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:minArgs>
      <swrlb:minArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:minArgs>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="stringEqualIgnoreCase">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="stringLength">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="sublist">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="substring">
      <swrlb:maxArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">4</swrlb:maxArgs>
      <swrlb:maxArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">4</swrlb:maxArgs>
```

```
      <swrlb:minArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:minArgs>
      <swrlb:minArgs
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:minArgs>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="substringAfter">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="substringBefore">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="subtract">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="subtractDates">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="subtractDateTimesYieldingDayTimeDuration">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="subtractDateTimesYieldingYearMonthDuration">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    </swrl:Builtin>
    <swrl:Builtin rdf:ID="subtractDayTimeDurationFromDate">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
```

```
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="subtractDayTimeDurationFromDateTime">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="subtractDayTimeDurationFromTime">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="subtractDayTimeDurations">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="subtractTimes">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="subtractYearMonthDurationFromDate">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="subtractYearMonthDurationFromDateTime">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="subtractYearMonthDurations">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="tan">
    <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
```

```
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="time">
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rdf:datatype="http://www.w3.org/2001/XMLSchema#int">5</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">5</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="translate">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">4</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">4</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="unaryMinus">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="unaryPlus">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="upperCase">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</swrlb:args>
  </swrl:Builtin>
  <swrl:Builtin rdf:ID="yearMonthDuration">
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
      <swrlb:args
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</swrlb:args>
  </swrl:Builtin>
</rdf:RDF>
```

```
<?xml version="1.0"?>


<!DOCTYPE rdf:RDF [
   <!ENTITY dcterms "http://purl.org/dc/terms/" >
   <!ENTITY foaf "http://xmlns.com/foaf/0.1/" >
   <!ENTITY owl "http://www.w3.org/2002/07/owl#" >
   <!ENTITY swrl "http://www.w3.org/2003/11/swrl#" >
   <!ENTITY swrlb "http://www.w3.org/2003/11/swrlb#" >
   <!ENTITY dc "http://purl.org/dc/elements/1.1/" >
   <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" >
   <!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#" >
   <!ENTITY BP "http://www.owl-ontologies.com/BP.owl#" >
   <!ENTITY daml "http://www.daml.org/2001/03/daml+oil#" >
   <!ENTITY BC "http://www.owl-ontologies.com/core.owl#" >
   <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#" >
   <!ENTITY swrlImport "http://www.daml.org/rules/proposal/swrl.owl#" >
   <!ENTITY swrlbImport "http://www.daml.org/rules/proposal/swrlb.owl#" >
   <!ENTITY vs "http://www.w3.org/2003/06/sw-vocab-status/ns#" >
   <!ENTITY p1 "http://protege.stanford.edu/plugins/owl/protege#" >
   <!ENTITY xsp "http://www.owl-ontologies.com/2005/08/07/xsp.owl#" >
   <!ENTITY PO "http://www.owl-ontologies.com/Ontology1156283607.owl#" >
   <!ENTITY OS "http://www.owl-ontologies.com/Ontology1156787408.owl#" >
   <!ENTITY p2 "http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#" >
   <!ENTITY UP
"http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#" >
]>


<rdf:RDF xmlns="http://www.owl-ontologies.com/Ontology1160514425.owl#"
    xml:base="http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl"
    xmlns:p1="http://protege.stanford.edu/plugins/owl/protege#"
    xmlns:OS="http://www.owl-ontologies.com/Ontology1156787408.owl#"
    xmlns:swrlbImport="http://www.daml.org/rules/proposal/swrlb.owl#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:BC="http://www.owl-ontologies.com/core.owl#"

xmlns:UP="http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#"
    xmlns:p2="http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#"
    xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
    xmlns:swrlImport="http://www.daml.org/rules/proposal/swrl.owl#"
    xmlns:foaf="http://xmlns.com/foaf/0.1/"
    xmlns:vs="http://www.w3.org/2003/06/sw-vocab-status/ns#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:dcterms="http://purl.org/dc/terms/"
```

```
  xmlns:xsp="http://www.owl-ontologies.com/2005/08/07/xsp.owl#"
  xmlns:dc="http://purl.org/dc/elements/1.1/"
  xmlns:swrl="http://www.w3.org/2003/11/swrl#"
  xmlns:BP="http://www.owl-ontologies.com/BP.owl#"
  xmlns:daml="http://www.daml.org/2001/03/daml+oil#"
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:PO="http://www.owl-ontologies.com/Ontology1156283607.owl#">
  <owl:Ontology rdf:about="">
    <owl:imports rdf:resource="http://www.w3.org/2003/06/sw-vocab-status/ns"/>
    <owl:imports rdf:resource="http://purl.org/dc/elements/1.1/"/>
  </owl:Ontology>
  <owl:Class rdf:ID="Abilities">
    <rdfs:subClassOf rdf:resource="#Abilities_and_Proficiencies"/>
  </owl:Class>
  <UP:Abilities rdf:ID="Abilities1"/>
  <owl:Class rdf:ID="Abilities_and_Proficiencies">
    <rdfs:subClassOf rdf:resource="#Information"/>
  </owl:Class>
  <owl:Class rdf:ID="Address">
    <rdfs:subClassOf rdf:resource="#Information"/>
  </owl:Class>
  <UP:Address rdf:ID="Address1"/>
  <owl:Class rdf:ID="Assessment_Information">
    <rdfs:subClassOf rdf:resource="#Dynamic_Information"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >1..n, each class contains statement about the user</rdfs:comment>
  </owl:Class>
  <UP:Assessment_Information rdf:ID="Assessment_Information1"/>
  <owl:Class rdf:ID="Behaviorial_Information">
    <rdfs:subClassOf rdf:resource="#Dynamic_Information"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >Describe what is user&apos;s BDI. Can be based on inferred information or
information that was directly entered to the system.</rdfs:comment>
  </owl:Class>
  <UP:Behaviorial_Information rdf:ID="Behaviorial_Information1"/>
  <owl:Class rdf:ID="Belief">
    <rdfs:subClassOf rdf:resource="#Dynamic_Information"/>
  </owl:Class>
  <UP:Belief rdf:ID="Belief1"/>
  <owl:Class rdf:ID="Contact_Information">
    <rdfs:subClassOf rdf:resource="#Information"/>
  </owl:Class>
  <UP:Contact_Information rdf:ID="Contact_Information1"/>
  <owl:Class rdf:ID="Demographic_Information">
    <rdfs:subClassOf rdf:resource="#Information"/>
  </owl:Class>
```

```
<UP:Demographic_Information rdf:ID="Demographic_Information1"/>
<owl:Class rdf:ID="Desire">
  <rdfs:subClassOf rdf:resource="#Dynamic_Information"/>
</owl:Class>
<UP:Desire rdf:ID="Desire1"/>
<owl:Class rdf:ID="Dynamic_Information">
  <rdfs:subClassOf rdf:resource="#Information"/>
  <rdfs:comment rdf:datatype="&xsd;string"
    >Domain-dependent information.</rdfs:comment>
</owl:Class>
<owl:DatatypeProperty rdf:ID="educationalLevel">
  <rdfs:domain rdf:resource="#Demographic_Information"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="Emotional_Trait">
  <rdfs:subClassOf rdf:resource="#Information"/>
</owl:Class>
<UP:Emotional_Trait rdf:ID="Emotional_Trait1"/>
<owl:DatatypeProperty rdf:ID="employment">
  <rdfs:domain rdf:resource="#Demographic_Information"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="Environmental_Traits">
  <rdfs:subClassOf rdf:resource="#Static_Information"/>
</owl:Class>
<UP:Environmental_Traits rdf:ID="Environmental_Traits1"/>
<owl:DatatypeProperty rdf:ID="family_status">
  <rdfs:domain rdf:resource="#Demographic_Information"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="first_language">
  <rdfs:domain rdf:resource="#Demographic_Information"/>
  <rdfs:range rdf:resource="&xsd;language"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="Geographical_Traits">
  <rdfs:subClassOf rdf:resource="#Static_Information"/>
  <dc:relation rdf:datatype="&xsd;string"

>http://www.getty.edu/research/conducting_research/vocabularies/tgn/</dc:relation>
</owl:Class>
<UP:Geographical_Traits rdf:ID="Geographical_Traits1"/>
<owl:Class rdf:ID="Hardware_Environment">
  <rdfs:subClassOf rdf:resource="#Information"/>
</owl:Class>
<UP:Hardware_Environment rdf:ID="Hardware_Environment1"/>
<owl:ObjectProperty rdf:ID="hasAbilities">
```

```
  <rdfs:domain rdf:resource="#Phisical_Traits"/>
  <rdfs:range rdf:resource="#Abilities"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasAddress">
  <rdfs:domain rdf:resource="#Contact_Information"/>
  <rdfs:range rdf:resource="#Address"/>
</owl:ObjectProperty>
<owl:DatatypeProperty rdf:ID="hasAge">
  <rdfs:domain rdf:resource="#Demographic_Information"/>
  <rdfs:range rdf:resource="&xsd;nonNegativeInteger"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="hasAgeGroup">
  <rdfs:domain rdf:resource="#Demographic_Information"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="hasAppartmentNumber">
  <rdfs:domain rdf:resource="#Address"/>
  <rdfs:range rdf:resource="&xsd;int"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="hasBehavior">
  <rdfs:range rdf:resource="#Behaviorial_Information"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasBelief">
  <rdfs:domain rdf:resource="#Behaviorial_Information"/>
  <rdfs:range rdf:resource="#Belief"/>
</owl:ObjectProperty>
<owl:DatatypeProperty rdf:ID="hasBirthday">
  <rdfs:domain rdf:resource="#Demographic_Information"/>
  <rdfs:range rdf:resource="&xsd;dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="hasCitizenship">
  <rdfs:domain rdf:resource="#Contact_Information"/>
  <rdfs:range rdf:resource="&xsd;anyURI"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="hasCity">
  <rdfs:domain rdf:resource="#Address"/>
  <rdfs:range rdf:resource="&xsd;anyURI"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="hasContactInformation">
  <rdfs:domain rdf:resource="#Sociological_Traits"/>
  <rdfs:range rdf:resource="#Contact_Information"/>
</owl:ObjectProperty>
<owl:DatatypeProperty rdf:ID="hasCountry">
  <rdfs:domain rdf:resource="#Address"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
```

```
  <owl:ObjectProperty rdf:ID="hasCreated">
    <rdf:type rdf:resource="&owl;TransitiveProperty"/>
    <rdfs:range rdf:resource="#Information"/>
    <owl:inverseOf rdf:resource="#hasCreatedBy"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="hasCreatedAt">
    <rdfs:domain rdf:resource="#Information"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >Time and Date of creation.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="hasCreatedBy">
    <rdf:type rdf:resource="&owl;TransitiveProperty"/>
    <rdfs:domain rdf:resource="#Information"/>
    <owl:inverseOf rdf:resource="#hasCreated"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >This dynamic information was created by the instance, which belongs to
class Creator.</rdfs:comment>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasDemographicInformation">
    <rdfs:domain rdf:resource="#Sociological_Traits"/>
    <rdfs:range rdf:resource="#Demographic_Information"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasDesire">
    <rdfs:domain rdf:resource="#Behaviorial_Information"/>
    <rdfs:range rdf:resource="#Desire"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="hasDurability">
    <rdfs:domain rdf:resource="#Situation"/>
    <rdfs:range rdf:resource="&xsd;duration"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >hasEnd.value - hasStart.value</rdfs:comment>
    <rdfs:comment rdf:datatype="&xsd;string"
      >OWL does not allow define this type of colculations. What is about
SWRL?</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="hasDynamics">
    <rdfs:range rdf:resource="#Dynamic_Information"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="hasEmail">
    <rdfs:domain rdf:resource="#Contact_Information"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="hasEmotions">
    <rdfs:domain rdf:resource="#Internal_Traits"/>
    <rdfs:range rdf:resource="#Emotional_Trait"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="hasEnd">
    <rdfs:domain rdf:resource="#Situation"/>
    <rdfs:range rdf:resource="&xsd;dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasExetutability">
    <rdfs:domain rdf:resource="#Model_Information"/>
    <rdfs:range rdf:resource="&xsd;boolean"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasExpirationDate">
    <rdfs:range rdf:resource="&xsd;dateTime"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >End of the period when this statement can be accessed with these
keys.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasFamilyName">
    <rdfs:domain rdf:resource="#Contact_Information"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasFaxNumber">
    <rdfs:domain rdf:resource="#Contact_Information"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasFullName">
    <rdfs:domain rdf:resource="#Contact_Information"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasGender">
    <rdfs:domain rdf:resource="#Demographic_Information"/>
    <rdfs:range>
      <owl:DataRange>
        <owl:oneOf>
          <rdf:List>
            <rdf:first rdf:datatype="&xsd;string">male</rdf:first>
            <rdf:rest>
              <rdf:List>
                <rdf:first rdf:datatype="&xsd;string">female</rdf:first>
                <rdf:rest rdf:resource="&rdf;nil"/>
              </rdf:List>
            </rdf:rest>
          </rdf:List>
        </owl:oneOf>
      </owl:DataRange>
    </rdfs:range>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasGivenName">
```

```
      <rdfs:domain rdf:resource="#Contact_Information"/>
      <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="hasHardware">
      <rdfs:domain rdf:resource="#Environmental_Traits"/>
      <rdfs:range rdf:resource="#Hardware_Environment"/>
    </owl:ObjectProperty>
    <owl:DatatypeProperty rdf:ID="hasHouseNumber">
      <rdfs:domain rdf:resource="#Address"/>
      <rdfs:range rdf:resource="&xsd;int"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="hasInformationAbout">
      <rdfs:domain rdf:resource="#Information"/>
      <owl:inverseOf rdf:resource="#hasModel"/>
      <rdfs:comment rdf:datatype="&xsd;string"
        >This property says about whom/what this statements were made
about.</rdfs:comment>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="hasIntention">
      <rdfs:domain rdf:resource="#Behaviorial_Information"/>
      <rdfs:range rdf:resource="#Intention"/>
    </owl:ObjectProperty>
    <owl:DatatypeProperty rdf:ID="hasIssuedDate">
      <rdfs:range rdf:resource="&xsd;dateTime"/>
      <rdfs:comment rdf:datatype="&xsd;string"
        >Begining of the period when this statement can be accessible with these
keys.</rdfs:comment>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="hasLanguage">
      <rdfs:range rdf:resource="&xsd;language"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="hasMentalState">
      <rdfs:domain rdf:resource="#Internal_Traits"/>
      <rdfs:range rdf:resource="#Mental_Trait"/>
    </owl:ObjectProperty>
    <owl:DatatypeProperty rdf:ID="hasMiddleName">
      <rdfs:domain rdf:resource="#Contact_Information"/>
      <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="hasMobilePhoneNumber">
      <rdfs:domain rdf:resource="#Contact_Information"/>
      <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="hasModel">
      <rdfs:range rdf:resource="#Information"/>
      <owl:inverseOf rdf:resource="#hasInformationAbout"/>
```

```
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="hasModelRealization">
    <rdfs:domain rdf:resource="#Model_Information"/>
    <rdfs:range rdf:resource="&xsd;string"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >Belief Networks, prolog, probabilities vector, etc. Everything that describes
a realization of a model. Complimentary to the property
&quot;hasRepresentation&quot;. It extands the information given by
&quot;hasRepresentation&quot;.</rdfs:comment>
    <dc:creator rdf:datatype="&xsd;string">Vadim Chepegin</dc:creator>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasModelType">
    <rdfs:domain rdf:resource="#Model_Information"/>
    <rdfs:range>
      <owl:DataRange>
        <owl:oneOf>
          <rdf:List>
            <rdf:first rdf:datatype="&xsd;string">buggy</rdf:first>
            <rdf:rest>
              <rdf:List>
                <rdf:first rdf:datatype="&xsd;string">overlay</rdf:first>
                <rdf:rest rdf:resource="&rdf;nil"/>
              </rdf:List>
            </rdf:rest>
          </rdf:List>
        </owl:oneOf>
      </owl:DataRange>
    </rdfs:range>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasNationality">
    <rdfs:domain rdf:resource="#Demographic_Information"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="hasNetwork">
    <rdfs:domain rdf:resource="#Environmental_Traits"/>
    <rdfs:range rdf:resource="#Network_Environment"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="hasOwner">
    <rdfs:domain rdf:resource="#Privacy_Information"/>
    <rdfs:range rdf:resource="&xsd;anyURI"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="hasPhysiologicalProcesses">
    <rdfs:domain rdf:resource="#Phisical_Traits"/>
    <rdfs:range rdf:resource="#Physiological_Processes"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="hasPosition">
```

```
      <rdfs:domain rdf:resource="#Situation"/>
      <rdfs:range rdf:resource="&xsd;anyURI"/>
      <rdfs:comment rdf:datatype="&xsd;string"
        >Geographical coordinates. It containes an external link to one of the
geographical ontologies/vocabularies.</rdfs:comment>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="hasPostalCode">
      <rdfs:domain rdf:resource="#Address"/>
      <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="hasPrivacyKey">
      <rdfs:domain rdf:resource="#Privacy_Information"/>
      <rdfs:range rdf:resource="&xsd;string"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="hasPrivacyPolicy">
      <rdfs:domain rdf:resource="#Privacy_Information"/>
      <rdfs:range rdf:resource="&xsd;anyURI"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="hasPrivacyRestriction">
      <rdfs:domain rdf:resource="#Information"/>
      <rdfs:range rdf:resource="#Privacy_Information"/>
      <rdfs:comment rdf:datatype="&xsd;string"
        >It might conect several Privacy classes to one statement. It allows different
Requestors access this statement with different rights, tima constraints,
etc.</rdfs:comment>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="hasProfile">
      <rdfs:range rdf:resource="#Static_Information"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="hasProposition">
      <rdfs:domain rdf:resource="#Dynamic_Information"/>
      <rdfs:range rdf:resource="#Proposition"/>
    </owl:ObjectProperty>
    <owl:DatatypeProperty rdf:ID="hasReliability">
      <rdfs:domain rdf:resource="#Model_Information"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="hasRepresentation">
      <rdfs:domain rdf:resource="#Model_Information"/>
      <rdfs:range>
        <owl:DataRange>
          <owl:oneOf>
            <rdf:List>
              <rdf:first rdf:datatype="&xsd;string">symbolic</rdf:first>
              <rdf:rest>
                <rdf:List>
                  <rdf:first rdf:datatype="&xsd;string">numerical</rdf:first>
              <rdf:rest rdf:resource="&rdf;nil"/>
            </rdf:List>
          </rdf:rest>
        </rdf:List>
      </owl:oneOf>
    </owl:DataRange>
  </rdfs:range>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="hasSalary">
  <rdfs:domain rdf:resource="#Demographic_Information"/>
  <rdfs:range rdf:resource="&xsd;float"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="hasSences">
  <rdfs:domain rdf:resource="#Phisical_Traits"/>
  <rdfs:range rdf:resource="#Sences"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasSituation">
  <rdfs:domain>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
        <owl:Class rdf:about="#Dynamic_Information"/>
        <owl:Class rdf:about="#Privacy_Information"/>
      </owl:unionOf>
    </owl:Class>
  </rdfs:domain>
  <rdfs:range rdf:resource="#Situation"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasSkills">
  <rdfs:domain rdf:resource="#Phisical_Traits"/>
  <rdfs:range rdf:resource="#Skills"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasSoftware">
  <rdfs:domain rdf:resource="#Environmental_Traits"/>
  <rdfs:range rdf:resource="#Software_Environment"/>
</owl:ObjectProperty>
<owl:DatatypeProperty rdf:ID="hasStart">
  <rdfs:domain rdf:resource="#Situation"/>
  <rdfs:range rdf:resource="&xsd;dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="hasStateOrProvince">
  <rdfs:domain rdf:resource="#Address"/>
  <rdfs:range rdf:resource="&xsd;string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="hasStreet">
  <rdfs:domain rdf:resource="#Address"/>
  <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasTelephoneNumber">
    <rdfs:domain rdf:resource="#Contact_Information"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasWebPageAddress">
    <rdfs:domain rdf:resource="#Contact_Information"/>
    <rdfs:range rdf:resource="&xsd;anyURI"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasWelth">
    <rdfs:domain rdf:resource="#Demographic_Information"/>
    <rdfs:range rdf:resource="&xsd;string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="Inffered_Information">
    <rdfs:subClassOf rdf:resource="#Dynamic_Information"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >Information generated by reasoners</rdfs:comment>
  </owl:Class>
  <UP:Inffered_Information rdf:ID="Inffered_Information1"/>
  <owl:Class rdf:ID="Information">
    <rdfs:comment rdf:datatype="&xsd;string"
      >Each concrete realization should be assigned with a concrete class by means
of &quot;owl:equivalentClass&quot; construct.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="Intention">
    <rdfs:subClassOf rdf:resource="#Dynamic_Information"/>
  </owl:Class>
  <UP:Intention rdf:ID="Intention1"/>
  <owl:Class rdf:ID="Internal_Traits">
    <rdfs:subClassOf rdf:resource="#Static_Information"/>
  </owl:Class>
  <UP:Internal_Traits rdf:ID="Internal_Traits1"/>
  <owl:Class rdf:ID="Mental_Trait">
    <rdfs:subClassOf rdf:resource="#Information"/>
  </owl:Class>
  <UP:Mental_Trait rdf:ID="Mental_Trait1"/>
  <owl:Class rdf:ID="Model_Information">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasExetutability"/>
        <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasReliability"/>
        <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf rdf:resource="#Information"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasModelType"/>
        <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasModelRealization"/>
        <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasRepresentation"/>
        <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <dc:identifier rdf:datatype="&xsd;string"
      >http://www.ei.sanken.osaka-u.ac.jp/aied99/a-papers/W-
Chen.pdf</dc:identifier>
    <dc:relation rdf:datatype="&xsd;string"
      >Derived from the paper by Weiqin Chen and Riichiro Mizoguchi
&quot;Communication Content Ontology for Learner Model Agent in Multi-agent
Architecture&quot;. AIED&apos;99</dc:relation>
  </owl:Class>
  <UP:Model_Information rdf:ID="Model_Information1"/>
  <owl:Class rdf:ID="Network_Environment">
    <rdfs:subClassOf rdf:resource="#Information"/>
  </owl:Class>
  <UP:Network_Environment rdf:ID="Network_Environment1"/>
  <owl:Class rdf:ID="Phisical_Traits">
    <rdfs:subClassOf rdf:resource="#Static_Information"/>
  </owl:Class>
  <UP:Phisical_Traits rdf:ID="Phisical_Traits1"/>
  <owl:Class rdf:ID="Physiological_Processes">
    <rdfs:subClassOf rdf:resource="#Information"/>
  </owl:Class>
  <UP:Physiological_Processes rdf:ID="Physiological_Processes1"/>
  <owl:Class rdf:ID="Privacy_Information">
    <rdfs:subClassOf rdf:resource="#Information"/>
    <rdfs:subClassOf>
```

```
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasOwner"/>
        <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:comment rdf:datatype="&xsd;string"
      >Now it also has a hasPrivacyRestriction property. Is it necessary and
logical?</rdfs:comment>
    <rdfs:comment rdf:datatype="&xsd;string"
      >Privacy is assigned to every element of a user model that makes it flexible to
manage access right for different groups of requestors.</rdfs:comment>
  </owl:Class>
  <UP:Privacy_Information rdf:ID="Privacy_Information1"/>
  <owl:Class rdf:ID="Proposition">
    <rdfs:subClassOf rdf:resource="#Information"/>
    <rdfs:subClassOf rdf:resource="&rdf;Statement"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >This part is a reification of rdf triple, e.g. subclass of rdf:Statement
(rdf:subject, rdf:predicate, and rdf:object).
It extends rdf:Statement with information about creator and time of
creation.</rdfs:comment>
  </owl:Class>
  <UP:Proposition rdf:ID="Proposition1"/>
  <owl:Class rdf:ID="Sences">
    <rdfs:subClassOf rdf:resource="#Abilities_and_Proficiencies"/>
  </owl:Class>
  <UP:Sences rdf:ID="Sences1"/>
  <owl:Class rdf:ID="Situation">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasLanguage"/>
        <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf rdf:resource="#Information"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasDurability"/>
        <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasEnd"/>
        <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasPosition"/>
        <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasStart"/>
        <owl:maxCardinality rdf:datatype="&xsd;int">1</owl:maxCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
  </owl:Class>
  <UP:Situation rdf:ID="Situation1">
    <UP:hasStart rdf:datatype="&xsd;dateTime"
      >2006-09-04T00:00:00</UP:hasStart>
  </UP:Situation>
  <owl:Class rdf:ID="Skills">
    <rdfs:subClassOf rdf:resource="#Abilities_and_Proficiencies"/>
  </owl:Class>
  <UP:Skills rdf:ID="Skills1"/>
  <owl:Class rdf:ID="Social_Traits">
    <rdfs:subClassOf rdf:resource="#Static_Information"/>
  </owl:Class>
  <UP:Social_Traits rdf:ID="Social_Traits1"/>
  <owl:Class rdf:ID="Sociological_Traits">
    <rdfs:subClassOf rdf:resource="#Static_Information"/>
  </owl:Class>
  <UP:Sociological_Traits rdf:ID="Sociological_Traits1"/>
  <owl:Class rdf:ID="Software_Environment">
    <rdfs:subClassOf rdf:resource="#Information"/>
  </owl:Class>
  <UP:Software_Environment rdf:ID="Software_Environment1"/>
  <owl:Class rdf:ID="Static_Information">
    <rdfs:subClassOf rdf:resource="#Information"/>
    <rdfs:comment rdf:datatype="&xsd;string"
      >Domain-independent information.</rdfs:comment>
    <rdfs:comment rdf:datatype="&xsd;string"
      >Static information in a context of user modeling (date of birth, education,
job, hardware, applications installed, etc.)</rdfs:comment>
  </owl:Class>
</rdf:RDF>
```

```
<?xml version="1.0"?>


<!DOCTYPE rdf:RDF [
   <!ENTITY dcterms "http://purl.org/dc/terms/" >
   <!ENTITY foaf "http://xmlns.com/foaf/0.1/" >
   <!ENTITY owl "http://www.w3.org/2002/07/owl#" >
   <!ENTITY swrl "http://www.w3.org/2003/11/swrl#" >
   <!ENTITY swrlb "http://www.w3.org/2003/11/swrlb#" >
   <!ENTITY dc "http://purl.org/dc/elements/1.1/" >
   <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" >
   <!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#" >
   <!ENTITY BP "http://www.owl-ontologies.com/BP.owl#" >
   <!ENTITY daml "http://www.daml.org/2001/03/daml+oil#" >
   <!ENTITY BC "http://www.owl-ontologies.com/core.owl#" >
   <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#" >
   <!ENTITY swrlImport "http://www.daml.org/rules/proposal/swrl.owl#" >
   <!ENTITY swrlbImport "http://www.daml.org/rules/proposal/swrlb.owl#" >
   <!ENTITY vs "http://www.w3.org/2003/06/sw-vocab-status/ns#" >
   <!ENTITY p1 "http://protege.stanford.edu/plugins/owl/protege#" >
   <!ENTITY xsp "http://www.owl-ontologies.com/2005/08/07/xsp.owl#" >
   <!ENTITY PO "http://www.owl-ontologies.com/Ontology1156283607.owl#" >
   <!ENTITY OS "http://www.owl-ontologies.com/Ontology1156787408.owl#" >
   <!ENTITY p2 "http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#" >
   <!ENTITY UP
"http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#" >
]>


<rdf:RDF xmlns="http://www.owl-ontologies.com/Ontology1160514425.owl#"
     xml:base="http://www.w3.org/2003/06/sw-vocab-status/ns"
     xmlns:p1="http://protege.stanford.edu/plugins/owl/protege#"
     xmlns:OS="http://www.owl-ontologies.com/Ontology1156787408.owl#"
     xmlns:swrlbImport="http://www.daml.org/rules/proposal/swrlb.owl#"
     xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
     xmlns:BC="http://www.owl-ontologies.com/core.owl#"

xmlns:UP="http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#"
     xmlns:p2="http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#"
     xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
     xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
     xmlns:swrlImport="http://www.daml.org/rules/proposal/swrl.owl#"
     xmlns:foaf="http://xmlns.com/foaf/0.1/"
   xmlns:vs="http://www.w3.org/2003/06/sw-vocab-status/ns#"
   xmlns:owl="http://www.w3.org/2002/07/owl#"
   xmlns:dcterms="http://purl.org/dc/terms/"
   xmlns:xsp="http://www.owl-ontologies.com/2005/08/07/xsp.owl#"
   xmlns:dc="http://purl.org/dc/elements/1.1/"
   xmlns:swrl="http://www.w3.org/2003/11/swrl#"
   xmlns:BP="http://www.owl-ontologies.com/BP.owl#"
   xmlns:daml="http://www.daml.org/2001/03/daml+oil#"
   xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
   xmlns:PO="http://www.owl-ontologies.com/Ontology1156283607.owl#">
  <owl:Ontology rdf:about="">
    <dc:title rdf:datatype="&xsd;string"
      >SemWeb Vocab Status ontology</dc:title>
    <dc:description rdf:datatype="&xsd;string"
      >An RDF vocabulary for relating SW vocabulary terms to their
status.</dc:description>
  </owl:Ontology>
  <rdf:Property rdf:ID="moreinfo">
    <vs:term_status rdf:datatype="&xsd;string">unstable</vs:term_status>
    <rdfs:label rdf:datatype="&xsd;string">more info</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd;string"
      >more information about the status etc of a term, typically human
oriented</rdfs:comment>
  </rdf:Property>
  <rdf:Property rdf:ID="term_status">
    <vs:term_status rdf:datatype="&xsd;string">unstable</vs:term_status>
    <rdfs:label rdf:datatype="&xsd;string">term status</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd;string"
      >the status of a vocabulary term, one of
&apos;stable&apos;,&apos;unstable&apos;,&apos;testing&apos;.</rdfs:comment>
  </rdf:Property>
  <rdf:Property rdf:ID="userdocs">
    <vs:term_status rdf:datatype="&xsd;string">unstable</vs:term_status>
    <rdfs:label rdf:datatype="&xsd;string">user docs</rdfs:label>
    <rdfs:comment rdf:datatype="&xsd;string"
      >human-oriented documentation, examples etc for use of this
term</rdfs:comment>
  </rdf:Property>
</rdf:RDF>
```

```
<?xml version="1.0"?>


<!DOCTYPE rdf:RDF [
   <!ENTITY dcterms "http://purl.org/dc/terms/" >
   <!ENTITY foaf "http://xmlns.com/foaf/0.1/" >
   <!ENTITY owl "http://www.w3.org/2002/07/owl#" >
   <!ENTITY swrl "http://www.w3.org/2003/11/swrl#" >
   <!ENTITY swrlb "http://www.w3.org/2003/11/swrlb#" >
   <!ENTITY dc "http://purl.org/dc/elements/1.1/" >
   <!ENTITY xsd "http://www.w3.org/2001/XMLSchema#" >
   <!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#" >
   <!ENTITY BP "http://www.owl-ontologies.com/BP.owl#" >
   <!ENTITY daml "http://www.daml.org/2001/03/daml+oil#" >
   <!ENTITY BC "http://www.owl-ontologies.com/core.owl#" >
   <!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#" >
   <!ENTITY swrlImport "http://www.daml.org/rules/proposal/swrl.owl#" >
   <!ENTITY swrlbImport "http://www.daml.org/rules/proposal/swrlb.owl#" >
   <!ENTITY vs "http://www.w3.org/2003/06/sw-vocab-status/ns#" >
   <!ENTITY p1 "http://protege.stanford.edu/plugins/owl/protege#" >
   <!ENTITY xsp "http://www.owl-ontologies.com/2005/08/07/xsp.owl#" >
   <!ENTITY PO "http://www.owl-ontologies.com/Ontology1156283607.owl#" >
   <!ENTITY OS "http://www.owl-ontologies.com/Ontology1156787408.owl#" >
   <!ENTITY p2 "http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#" >
   <!ENTITY UP
"http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#" >
]>


<rdf:RDF xmlns="http://www.owl-ontologies.com/Ontology1160514425.owl#"
     xml:base="http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl"
     xmlns:p1="http://protege.stanford.edu/plugins/owl/protege#"
     xmlns:OS="http://www.owl-ontologies.com/Ontology1156787408.owl#"
     xmlns:swrlbImport="http://www.daml.org/rules/proposal/swrlb.owl#"
     xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
     xmlns:BC="http://www.owl-ontologies.com/core.owl#"

xmlns:UP="http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#"
     xmlns:p2="http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#"
     xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
     xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
     xmlns:swrlImport="http://www.daml.org/rules/proposal/swrl.owl#"
```

```
 xmlns:foaf="http://xmlns.com/foaf/0.1/"
 xmlns:vs="http://www.w3.org/2003/06/sw-vocab-status/ns#"
 xmlns:owl="http://www.w3.org/2002/07/owl#"
 xmlns:dcterms="http://purl.org/dc/terms/"
 xmlns:xsp="http://www.owl-ontologies.com/2005/08/07/xsp.owl#"
 xmlns:dc="http://purl.org/dc/elements/1.1/"
 xmlns:swrl="http://www.w3.org/2003/11/swrl#"
 xmlns:BP="http://www.owl-ontologies.com/BP.owl#"
 xmlns:daml="http://www.daml.org/2001/03/daml+oil#"
 xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
 xmlns:PO="http://www.owl-ontologies.com/Ontology1156283607.owl#">
<owl:Ontology rdf:about=""/>
<owl:Ontology rdf:about="http://purl.org/dc/elements/1.1/"/>
<owl:DatatypeProperty rdf:about="&dc;contributor">
  <rdf:type rdf:resource="&owl;AnnotationProperty"/>
  <rdfs:label xml:lang="en-US">Contributor</rdfs:label>
  <rdfs:comment xml:lang="en-US"
     >An entity responsible for making contributions to the
   content of the resource.</rdfs:comment>
  <dc:description xml:lang="en-US"
     >Examples of a Contributor include a person, an
   organisation, or a service.  Typically, the name of a
   Contributor should be used to indicate the entity.</dc:description>
  <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:about="&dc;coverage">
  <rdf:type rdf:resource="&owl;AnnotationProperty"/>
  <rdfs:label xml:lang="en-US">Coverage</rdfs:label>
  <rdfs:comment xml:lang="en-US"
     >The extent or scope of the content of the resource.</rdfs:comment>
  <dc:description xml:lang="en-US"
     >Coverage will typically include spatial location (a place name
   or geographic coordinates), temporal period (a period label,
   date, or date range) or jurisdiction (such as a named
   administrative entity).
   Recommended best practice is to select a value from a
   controlled vocabulary (for example, the Thesaurus of Geographic
   Names [TGN]) and that, where appropriate, named places or time
   periods be used in preference to numeric identifiers such as
   sets of coordinates or date ranges.</dc:description>
  <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:about="&dc;creator">
  <rdf:type rdf:resource="&owl;AnnotationProperty"/>
  <rdfs:label xml:lang="en-US">Creator</rdfs:label>
  <rdfs:comment xml:lang="en-US"
```

```
      >An entity primarily responsible for making the content
     of the resource.</rdfs:comment>
    <dc:description xml:lang="en-US"
      >Examples of a Creator include a person, an organisation,
     or a service.  Typically, the name of a Creator should
     be used to indicate the entity.</dc:description>
    <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="&dc;date">
    <rdf:type rdf:resource="&owl;AnnotationProperty"/>
    <rdfs:label xml:lang="en-US">Date</rdfs:label>
    <rdfs:comment xml:lang="en-US"
      >A date associated with an event in the life cycle of the
     resource.</rdfs:comment>
    <dc:description xml:lang="en-US"
      >Typically, Date will be associated with the creation or
     availability of the resource.  Recommended best practice
     for encoding the date value is defined in a profile of
     ISO 8601 [W3CDTF] and follows the YYYY-MM-DD
format.</dc:description>
    <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="&dc;description">
    <rdf:type rdf:resource="&owl;AnnotationProperty"/>
    <rdfs:label xml:lang="en-US">Description</rdfs:label>
    <rdfs:comment xml:lang="en-US"
      >An account of the content of the resource.</rdfs:comment>
    <dc:description xml:lang="en-US"
      >Description may include but is not limited to: an abstract,
     table of contents, reference to a graphical representation
     of content or a free-text account of the content.</dc:description>
    <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="&dc;format">
    <rdf:type rdf:resource="&owl;AnnotationProperty"/>
    <rdfs:label xml:lang="en-US">Format</rdfs:label>
    <rdfs:comment xml:lang="en-US"
      >The physical or digital manifestation of the resource.</rdfs:comment>
    <dc:description xml:lang="en-US"
      >Typically, Format may include the media-type or dimensions of
     the resource. Format may be used to determine the software,
     hardware or other equipment needed to display or operate the
     resource. Examples of dimensions include size and duration.
     Recommended best practice is to select a value from a
     controlled vocabulary (for example, the list of Internet Media
     Types [MIME] defining computer media formats).</dc:description>
    <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="&dc;identifier">
    <rdf:type rdf:resource="&owl;AnnotationProperty"/>
    <rdfs:label xml:lang="en-US"
      >Resource Identifier</rdfs:label>
    <rdfs:comment xml:lang="en-US"
      >An unambiguous reference to the resource within a given
context.</rdfs:comment>
    <dc:description xml:lang="en-US"
      >Recommended best practice is to identify the resource by means
     of a string or number conforming to a formal identification
     system.
     Example formal identification systems include the Uniform
     Resource Identifier (URI) (including the Uniform Resource
     Locator (URL)), the Digital Object Identifier (DOI) and the
     International Standard Book Number (ISBN).</dc:description>
    <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="&dc;language">
    <rdf:type rdf:resource="&owl;AnnotationProperty"/>
    <rdfs:label xml:lang="en-US">Language</rdfs:label>
    <rdfs:comment xml:lang="en-US"
      >A language of the intellectual content of the resource.</rdfs:comment>
    <dc:description xml:lang="en-US"
      >Recommended best practice is to use RFC 3066 [RFC3066],
     which, in conjunction with ISO 639 [ISO639], defines two-
     and three-letter primary language tags with optional
     subtags.  Examples include &quot;en&quot; or &quot;eng&quot; for English,
     &quot;akk&quot; for Akkadian, and &quot;en-GB&quot; for English used in
the
     United Kingdom.</dc:description>
    <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="&dc;publisher">
    <rdf:type rdf:resource="&owl;AnnotationProperty"/>
    <rdfs:label xml:lang="en-US">Publisher</rdfs:label>
    <rdfs:comment xml:lang="en-US"
      >An entity responsible for making the resource available</rdfs:comment>
    <dc:description xml:lang="en-US"
      >Examples of a Publisher include a person, an organisation,
     or a service.
     Typically, the name of a Publisher should be used to
     indicate the entity.</dc:description>
    <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
  </owl:DatatypeProperty>
```

```
<owl:DatatypeProperty rdf:about="&dc;relation">
  <rdf:type rdf:resource="&owl;AnnotationProperty"/>
  <rdfs:label xml:lang="en-US">Relation</rdfs:label>
  <rdfs:comment xml:lang="en-US"
     >A reference to a related resource.</rdfs:comment>
  <dc:description xml:lang="en-US"
     >
   Recommended best practice is to reference the resource by means
   of a string or number conforming to a formal identification
   system.
</dc:description>
  <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:about="&dc;rights">
  <rdf:type rdf:resource="&owl;AnnotationProperty"/>
  <rdfs:label xml:lang="en-US"
     >Rights Management</rdfs:label>
  <rdfs:comment xml:lang="en-US"
     >Information about rights held in and over the resource.</rdfs:comment>
  <dc:description xml:lang="en-US"
     >
   Typically, a Rights element will contain a rights
   management statement for the resource, or reference
   a service providing such information. Rights information
   often encompasses Intellectual Property Rights (IPR),
   Copyright, and various Property Rights.
   If the Rights element is absent, no assumptions can be made
   about the status of these and other rights with respect to
   the resource.
</dc:description>
  <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:about="&dc;source">
  <rdf:type rdf:resource="&owl;AnnotationProperty"/>
  <rdfs:label xml:lang="en-US">Source</rdfs:label>
  <rdfs:comment xml:lang="en-US"
     >A reference to a resource from which the present resource
   is derived.</rdfs:comment>
  <dc:description xml:lang="en-US"
     >The present resource may be derived from the Source resource
   in whole or in part.  Recommended best practice is to reference
   the resource by means of a string or number conforming to a
   formal identification system.</dc:description>
  <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:about="&dc;subject">
```

```
    <rdf:type rdf:resource="&owl;AnnotationProperty"/>
    <rdfs:label xml:lang="en-US"
      >Subject and Keywords</rdfs:label>
    <rdfs:comment xml:lang="en-US"
      >The topic of the content of the resource.</rdfs:comment>
    <dc:description xml:lang="en-US"
      >Typically, a Subject will be expressed as keywords,
     key phrases or classification codes that describe a topic
     of the resource.  Recommended best practice is to select
     a value from a controlled vocabulary or formal
     classification scheme.</dc:description>
    <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="&dc;title">
    <rdf:type rdf:resource="&owl;AnnotationProperty"/>
    <rdfs:label xml:lang="en-US">Title</rdfs:label>
    <rdfs:comment xml:lang="en-US"
      >A name given to the resource.</rdfs:comment>
    <dc:description xml:lang="en-US"
      >
    Typically, a Title will be a name by which the resource is
     formally known.
  </dc:description>
    <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="&dc;type">
    <rdf:type rdf:resource="&owl;AnnotationProperty"/>
    <rdfs:label xml:lang="en-US">Resource Type</rdfs:label>
    <rdfs:comment xml:lang="en-US"
      >The nature or genre of the content of the resource.</rdfs:comment>
    <dc:description xml:lang="en-US"
      >Type includes terms describing general categories, functions,
     genres, or aggregation levels for content. Recommended best
     practice is to select a value from a controlled vocabulary
     (for example, the DCMI Type Vocabulary [DCMITYPE]). To
     describe the physical or digital manifestation of the
     resource, use the Format element.</dc:description>
    <rdfs:isDefinedBy rdf:resource="http://purl.org/dc/elements/1.1/"/>
  </owl:DatatypeProperty>
</rdf:RDF>
```

```xml
<?xml version="1.0"?>
<rdf:RDF xmlns="http://www.owl-ontologies.com/Ontology1160514425.owl#"
    xml:base="http://www.owl-ontologies.com/Ontology1156283607.owl"
    xmlns:p1="http://protege.stanford.edu/plugins/owl/protege#"
    xmlns:OS="http://www.owl-ontologies.com/Ontology1156787408.owl#"
    xmlns:swrlbImport="http://www.daml.org/rules/proposal/swrlb.owl#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:BC="http://www.owl-ontologies.com/core.owl#"

xmlns:UP="http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#"
    xmlns:p2="http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#"
    xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
    xmlns:swrlImport="http://www.daml.org/rules/proposal/swrl.owl#"
    xmlns:foaf="http://xmlns.com/foaf/0.1/"
    xmlns:vs="http://www.w3.org/2003/06/sw-vocab-status/ns#"
    xmlns:owl="http://www.w3.org/2002/07/owl#"
    xmlns:dcterms="http://purl.org/dc/terms/"
    xmlns:xsp="http://www.owl-ontologies.com/2005/08/07/xsp.owl#"
    xmlns:dc="http://purl.org/dc/elements/1.1/"
    xmlns:swrl="http://www.w3.org/2003/11/swrl#"
    xmlns:BP="http://www.owl-ontologies.com/BP.owl#"
    xmlns:daml="http://www.daml.org/2001/03/daml+oil#"
    xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
    xmlns:PO="http://www.owl-ontologies.com/Ontology1156283607.owl#">
    <owl:Ontology rdf:about=""/>
    <owl:Class rdf:ID="_Component">
      <rdfs:subClassOf rdf:resource="#RecommendItem"/>
    </owl:Class>
    <owl:Class rdf:ID="_Product">
      <rdfs:subClassOf rdf:resource="#RecommendItem"/>
    </owl:Class>
    <owl:DatatypeProperty rdf:ID="address">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <PO:MotherboardExtensionSlot_Port rdf:ID="AGP"/>
    <PO:ComponentManufacturer rdf:ID="AMD_Advanced_Micro_Devices"/>
    <PO:ComponentManufacturer rdf:ID="AMI_American_Megatrends"/>
```

```
<PO:MotherboardBIOS rdf:ID="amiBIOS-8">
  <PO:hasManufacturer rdf:resource="#AMI_American_Megatrends"/>
</PO:MotherboardBIOS>
<PO:ComputerManufacturer rdf:ID="Apple"/>
<owl:Class rdf:ID="ATA100">
  <rdfs:subClassOf rdf:resource="#IDE"/>
</owl:Class>
<owl:Class rdf:ID="ATA33">
  <rdfs:subClassOf rdf:resource="#IDE"/>
</owl:Class>
<owl:Class rdf:ID="ATA66">
  <rdfs:subClassOf rdf:resource="#IDE"/>
</owl:Class>
<PO:Bit_32 rdf:ID="Athlon">
  <PO:hasManufacturer rdf:resource="#AMD_Advanced_Micro_Devices"/>
</PO:Bit_32>
<PO:Bit_64 rdf:ID="Athlon_64">
  <PO:hasManufacturer rdf:resource="#AMD_Advanced_Micro_Devices"/>
</PO:Bit_64>
<PO:Bit_64 rdf:ID="Athlon_64_FX">
  <PO:hasManufacturer rdf:resource="#AMD_Advanced_Micro_Devices"/>
</PO:Bit_64>
<PO:Bit_32 rdf:ID="Athlon_64FX">
  <PO:hasManufacturer rdf:resource="#AMD_Advanced_Micro_Devices"/>
</PO:Bit_32>
<PO:Bit_32 rdf:ID="Athlon_XP">
  <PO:hasManufacturer rdf:resource="#AMD_Advanced_Micro_Devices"/>
</PO:Bit_32>
<owl:Class rdf:ID="ATX">
  <rdfs:subClassOf rdf:resource="#Motherboard"/>
</owl:Class>
<owl:Class rdf:ID="B32">
  <rdfs:subClassOf rdf:resource="#Dual"/>
</owl:Class>
<owl:Class rdf:ID="B64">
  <rdfs:subClassOf rdf:resource="#Dual"/>
</owl:Class>
<owl:DatatypeProperty rdf:ID="because">
  <rdfs:domain rdf:resource="#RecommendItem"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="belongstoSalesOrder">
  <rdfs:range rdf:resource="#SalesOrder"/>
  <owl:inverseOf rdf:resource="#hasLineItems"/>
</owl:ObjectProperty>
<owl:Class rdf:ID="Bit_32">
```

```
    <rdfs:subClassOf rdf:resource="#CPU"/>
  </owl:Class>
  <owl:Class rdf:ID="Bit_64">
    <rdfs:subClassOf rdf:resource="#CPU"/>
  </owl:Class>
  <owl:Class rdf:ID="BNC">
    <rdfs:subClassOf rdf:resource="#NetworkCardConnector"/>
  </owl:Class>
  <owl:Class rdf:ID="BTX">
    <rdfs:subClassOf rdf:resource="#Motherboard"/>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="cacheSize">
    <rdfs:domain rdf:resource="#CPU"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="capacity">
    <rdfs:domain rdf:resource="#HardDisk"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#float"/>
    <rdfs:comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">measured in
MB</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="category">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="CD">
    <rdfs:subClassOf rdf:resource="#CDDisk"/>
  </owl:Class>
  <owl:Class rdf:ID="CD-disk">
    <rdfs:subClassOf rdf:resource="#Media"/>
  </owl:Class>
  <owl:Class rdf:ID="CD-R">
    <rdfs:subClassOf rdf:resource="#CDDisk"/>
  </owl:Class>
  <owl:Class rdf:ID="CD-RW">
    <rdfs:subClassOf rdf:resource="#CDDisk"/>
  </owl:Class>
  <owl:Class rdf:ID="CDDisk">
    <rdfs:subClassOf rdf:resource="#Standard_Definition_Type"/>
  </owl:Class>
  <owl:Class rdf:ID="CDDrive">
    <rdfs:subClassOf rdf:resource="#MediaDrive"/>
  </owl:Class>
  <PO:Bit_32 rdf:ID="Celeron_P4-based">
    <PO:hasManufacturer rdf:resource="#Intel"/>
  </PO:Bit_32>
  <PO:Bit_32 rdf:ID="Celeron_PIII-based">
    <PO:hasManufacturer rdf:resource="#Intel"/>
  </PO:Bit_32>
  <owl:DatatypeProperty rdf:ID="clockSpeed">
    <rdfs:domain rdf:resource="#CPU"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
    <rdfs:comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">measured in
MHz</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="ComponentManufacturer"/>
  <owl:DatatypeProperty rdf:ID="componentVendorAddress">
    <rdfs:domain rdf:resource="#ComponentManufacturer"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="ComputerAssembled_box">
    <rdfs:subClassOf rdf:resource="#Product"/>
  </owl:Class>
  <owl:Class rdf:ID="ComputerComponent">
    <rdfs:subClassOf rdf:resource="#Product"/>
  </owl:Class>
  <owl:Class rdf:ID="ComputerManufacturer"/>
  <owl:Class rdf:ID="ComputerOEM_box">
    <rdfs:subClassOf rdf:resource="#Product"/>
  </owl:Class>
  <owl:Class rdf:ID="ComputerPeripheral">
    <rdfs:subClassOf rdf:resource="#Product"/>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="computerType">
    <rdfs:domain rdf:resource="#ComputerAssembled_box"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="computerVendorAddress">
    <rdfs:domain rdf:resource="#ComputerManufacturer"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="ComputerWholeUnit">
    <rdfs:subClassOf rdf:resource="#Product"/>
  </owl:Class>
  <owl:Class rdf:ID="CPU">
    <rdfs:subClassOf rdf:resource="#ComputerComponent"/>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="customer-id">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="DB9_RJ45JACK">
    <rdfs:subClassOf rdf:resource="#NetworkCardConnector"/>
  </owl:Class>
  <owl:Class rdf:ID="DDR_SDRAM">
    <rdfs:subClassOf rdf:resource="#MemoryType"/>
  </owl:Class>
  <PO:ComputerManufacturer rdf:ID="Dell"/>
  <PO:Monitor rdf:ID="DellMonitor231">
    <PO:category rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Computer Peripherals</PO:category>
    <PO:price
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">400</PO:price>
    <PO:nameOEM
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">DellMonitor231</PO:
nameOEM>
    <PO:partnumber
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1002</PO:partnumber>
  </PO:Monitor>
  <owl:Class rdf:ID="DIMM_MemoryModule">
    <rdfs:subClassOf rdf:resource="#Memory"/>
  </owl:Class>
  <owl:Class rdf:ID="Dual">
    <rdfs:subClassOf rdf:resource="#MultiCore"/>
  </owl:Class>
  <PO:Bit_32 rdf:ID="Duron">
    <PO:hasManufacturer rdf:resource="#AMD_Advanced_Micro_Devices"/>
  </PO:Bit_32>
  <owl:Class rdf:ID="DVD-disk">
    <rdfs:subClassOf rdf:resource="#Media"/>
  </owl:Class>
  <owl:Class rdf:ID="DVDDisk">
    <rdfs:subClassOf rdf:resource="#Standard_Definition_Type"/>
  </owl:Class>
  <owl:Class rdf:ID="DVDDrive">
    <rdfs:subClassOf rdf:resource="#MediaDrive"/>
  </owl:Class>
  <owl:Class rdf:ID="ExternalDisk">
    <rdfs:subClassOf rdf:resource="#HardDisk"/>
  </owl:Class>
  <owl:Class rdf:ID="FireWire_IEEE1394">
    <rdfs:subClassOf rdf:resource="#HardDriveConnection"/>
  </owl:Class>
  <owl:Class rdf:ID="FlushMemory_Stick">
    <rdfs:subClassOf rdf:resource="#Media"/>
  </owl:Class>
```

```
<owl:DatatypeProperty rdf:ID="frontSideBus">
  <rdfs:domain rdf:resource="#CPU"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="HardDisk">
  <rdfs:subClassOf rdf:resource="#ComputerComponent"/>
</owl:Class>
<owl:Class rdf:ID="HardDriveConnection">
  <rdfs:subClassOf rdf:resource="#Standard_Definition_Type"/>
</owl:Class>
<owl:DatatypeProperty rdf:ID="hardDriveSize">
  <rdfs:domain rdf:resource="#ComputerOEM_box"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="hasBox">
  <rdfs:domain rdf:resource="#ComputerWholeUnit"/>
  <rdfs:range>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
        <owl:Class rdf:about="#ComputerAssembled_box"/>
        <owl:Class rdf:about="#Server"/>
        <owl:Class rdf:about="#Workstation"/>
      </owl:unionOf>
    </owl:Class>
  </rdfs:range>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasChipSet">
  <rdfs:domain rdf:resource="#Motherboard"/>
  <rdfs:range rdf:resource="#MotherboardChipset"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasComputerCPU_OEM">
  <rdfs:domain rdf:resource="#ComputerOEM_box"/>
  <rdfs:range rdf:resource="#CPU"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasComputerManufacturer">
  <rdfs:domain rdf:resource="#ComputerOEM_box"/>
  <rdfs:range rdf:resource="#ComputerManufacturer"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasCPU_A">
  <rdfs:domain rdf:resource="#ComputerAssembled_box"/>
  <rdfs:range rdf:resource="#CPU"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasCPUSocket">
  <rdfs:domain rdf:resource="#Motherboard"/>
  <rdfs:range rdf:resource="#MotherboardCPUSocket"/>
</owl:ObjectProperty>
```

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  <owl:ObjectProperty rdf:ID="hasCustomerID">
    <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
    <rdfs:domain rdf:resource="#SalesOrder"/>
    <owl:inverseOf rdf:resource="#hasSalesOrder"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasExtensionSlot">
    <rdfs:domain rdf:resource="#Motherboard"/>
    <rdfs:range rdf:resource="#MotherboardExtensionSlot_Port"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasHardDisk_A">
    <rdfs:domain rdf:resource="#ComputerAssembled_box"/>
    <rdfs:range rdf:resource="#HardDisk"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasKeyboard">
    <rdfs:domain rdf:resource="#ComputerWholeUnit"/>
    <rdfs:range rdf:resource="#Keyboard"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasLineItems">
    <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
    <rdfs:domain rdf:resource="#SalesOrder"/>
    <owl:inverseOf rdf:resource="#belongstoSalesOrder"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasManufacturer">
    <rdfs:domain rdf:resource="#ComputerComponent"/>
    <rdfs:range rdf:resource="#ComponentManufacturer"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasMemory_A">
    <rdfs:domain rdf:resource="#ComputerAssembled_box"/>
    <rdfs:range rdf:resource="#Memory"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasMonitor">
    <rdfs:domain rdf:resource="#ComputerWholeUnit"/>
    <rdfs:range rdf:resource="#Monitor"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasMotherboard_A">
    <rdfs:domain rdf:resource="#ComputerAssembled_box"/>
    <rdfs:range rdf:resource="#Motherboard"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasMotherboardBIOS">
    <rdfs:domain rdf:resource="#Motherboard"/>
    <rdfs:range rdf:resource="#MotherboardBIOS"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasMouse">
    <rdfs:domain rdf:resource="#ComputerWholeUnit"/>
    <rdfs:range rdf:resource="#Mouse"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasNetworkCard_A">
    <rdfs:domain rdf:resource="#ComputerAssembled_box"/>
    <rdfs:range rdf:resource="#NetworkCard"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="haspartnumber"/>
  <owl:ObjectProperty rdf:ID="hasPrinter">
    <rdfs:domain rdf:resource="#ComputerWholeUnit"/>
    <rdfs:range rdf:resource="#Printer"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasSalesOrder">
    <rdfs:range rdf:resource="#SalesOrder"/>
    <owl:inverseOf rdf:resource="#hasCustomerID"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasSoundCard_A">
    <rdfs:domain rdf:resource="#ComputerAssembled_box"/>
    <rdfs:range rdf:resource="#SoundCard"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasSpeaker">
    <rdfs:domain rdf:resource="#ComputerWholeUnit"/>
    <rdfs:range rdf:resource="#Speakers"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasVideoCard_A">
    <rdfs:domain rdf:resource="#ComputerAssembled_box"/>
    <rdfs:range rdf:resource="#VideoCard"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hesMediaDrive_A">
    <rdfs:domain rdf:resource="#ComputerAssembled_box"/>
    <rdfs:range rdf:resource="#MediaDrive"/>
  </owl:ObjectProperty>
  <PO:ComputerManufacturer rdf:ID="HP"/>
  <PO:ComputerManufacturer rdf:ID="IBM"/>
  <PO:Monitor rdf:ID="IBMMonitor321">
    <PO:category rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Computer Peripherals</PO:category>
    <PO:price
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">300</PO:price>
    <PO:nameOEM
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">IBMMonitor321</PO:
nameOEM>
    <PO:partnumber
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1003</PO:partnumber>
  </PO:Monitor>
  <owl:Class rdf:ID="IDE">
    <rdfs:subClassOf rdf:resource="#HardDriveConnection"/>
```

```
</owl:Class>
<PO:ComponentManufacturer rdf:ID="Intel"/>
<owl:Class rdf:ID="InternalDisk">
   <rdfs:subClassOf rdf:resource="#HardDisk"/>
</owl:Class>
<PO:MotherboardExtensionSlot_Port rdf:ID="ISA"/>
<PO:Bit_64 rdf:ID="Itanium">
   <PO:hasManufacturer rdf:resource="#Intel"/>
</PO:Bit_64>
<PO:B64 rdf:ID="Itanium_2">
   <PO:hasManufacturer rdf:resource="#Intel"/>
</PO:B64>
<owl:Class rdf:ID="Keyboard">
   <rdfs:subClassOf rdf:resource="#ComputerPeripheral"/>
</owl:Class>
<owl:Class rdf:ID="Laptop">
   <rdfs:subClassOf rdf:resource="#ComputerOEM_box"/>
</owl:Class>
<owl:DatatypeProperty rdf:ID="lineitemnumber">
   <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
   <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="madetoPartNumber">
   <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
   <rdfs:domain rdf:resource="#RecommendItem"/>
   <rdfs:range rdf:resource="#Product"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="madetoSalesOrder">
   <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
   <rdfs:domain rdf:resource="#RecommendItem"/>
   <rdfs:range rdf:resource="#SalesOrder"/>
</owl:ObjectProperty>
<owl:Class rdf:ID="Mainstream">
   <rdfs:subClassOf rdf:resource="#VideoCard"/>
</owl:Class>
<owl:Class rdf:ID="Media">
   <rdfs:subClassOf rdf:resource="#Product"/>
</owl:Class>
<owl:Class rdf:ID="MediaDrive">
   <rdfs:subClassOf rdf:resource="#ComputerComponent"/>
</owl:Class>
<owl:Class rdf:ID="Memory">
   <rdfs:subClassOf rdf:resource="#ComputerComponent"/>
</owl:Class>
<owl:DatatypeProperty rdf:ID="memorySize">
   <rdfs:domain rdf:resource="#ComputerOEM_box"/>
```

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    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="MemoryType">
    <rdfs:subClassOf rdf:resource="#Standard_Definition_Type"/>
  </owl:Class>
  <owl:Class rdf:ID="MicroATX_FlexATX">
    <rdfs:subClassOf rdf:resource="#Motherboard"/>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="modelName">
    <rdfs:domain rdf:resource="#ComputerOEM_box"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="Monitor">
    <rdfs:subClassOf rdf:resource="#ComputerPeripheral"/>
  </owl:Class>
  <owl:Class rdf:ID="Motherboard">
    <rdfs:subClassOf rdf:resource="#ComputerComponent"/>
  </owl:Class>
  <owl:Class rdf:ID="MotherboardBIOS">
    <rdfs:subClassOf rdf:resource="#ComputerComponent"/>
  </owl:Class>
  <owl:Class rdf:ID="MotherboardChipset">
    <rdfs:subClassOf rdf:resource="#ComputerComponent"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >1. Memory Control Hub
2. I/O Control Hub</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="MotherboardCPUSocket">
    <rdfs:subClassOf rdf:resource="#Standard_Definition_Type"/>
  </owl:Class>
  <owl:Class rdf:ID="MotherboardExtensionSlot_Port">
    <rdfs:subClassOf rdf:resource="#Standard_Definition_Type"/>
  </owl:Class>
  <owl:Class rdf:ID="Mouse">
    <rdfs:subClassOf rdf:resource="#ComputerPeripheral"/>
  </owl:Class>
  <owl:Class rdf:ID="MultiCore">
    <rdfs:subClassOf rdf:resource="#CPU"/>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="Name">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="name">
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
```

```
<owl:DatatypeProperty rdf:ID="nameOEM">
   <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
   <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="NetworkCard">
   <rdfs:subClassOf rdf:resource="#ComputerComponent"/>
</owl:Class>
<owl:Class rdf:ID="NetworkCardConnector">
   <rdfs:subClassOf rdf:resource="#Standard_Definition_Type"/>
</owl:Class>
<owl:ObjectProperty rdf:ID="ObjectProperty_39"/>
<PO:Bit_32 rdf:ID="Optron">
   <PO:hasManufacturer rdf:resource="#AMD_Advanced_Micro_Devices"/>
</PO:Bit_32>
<owl:DatatypeProperty rdf:ID="OrderNumber">
   <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
   <rdfs:domain rdf:resource="#SalesOrder"/>
   <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="partNumber">
   <rdfs:domain rdf:resource="#ComputerComponent"/>
   <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="partnumber">
   <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
   <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
</owl:DatatypeProperty>
<PO:MotherboardExtensionSlot_Port rdf:ID="PCI"/>
<PO:MotherboardExtensionSlot_Port rdf:ID="PCI-X"/>
<PO:Bit_32 rdf:ID="Pentium_4">
   <PO:hasManufacturer rdf:resource="#Intel"/>
</PO:Bit_32>
<PO:Bit_32 rdf:ID="Pentium_III">
   <PO:hasManufacturer rdf:resource="#Intel"/>
</PO:Bit_32>
<PO:ComponentManufacturer rdf:ID="Phoenix"/>
<PO:MotherboardBIOS rdf:ID="phoenixBIOS-v6">
   <PO:hasManufacturer rdf:resource="#Phoenix"/>
</PO:MotherboardBIOS>
<owl:DatatypeProperty rdf:ID="price">
   <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
   <rdfs:domain rdf:resource="#Product"/>
   <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="Printer">
   <rdfs:subClassOf rdf:resource="#ComputerPeripheral"/>
```

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  </owl:Class>
  <owl:Class rdf:ID="Product"/>
  <owl:DatatypeProperty rdf:ID="quantity">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="RecommendItem"/>
  <owl:ObjectProperty rdf:ID="requires">
    <rdfs:range rdf:resource="#Product"/>
  </owl:ObjectProperty>
  <owl:Class rdf:ID="RIMM_MemoryModule">
    <rdfs:subClassOf rdf:resource="#Memory"/>
  </owl:Class>
  <owl:Class rdf:ID="RJ45">
    <rdfs:subClassOf rdf:resource="#NetworkCardConnector"/>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="rotationalSpeed">
    <rdfs:domain rdf:resource="#HardDisk"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#float"/>
    <rdfs:comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">measured in
RPM</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="SalesOrder"/>
  <owl:DatatypeProperty rdf:ID="screenSize">
    <rdfs:domain rdf:resource="#Laptop"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="SCSI">
    <rdfs:subClassOf rdf:resource="#HardDriveConnection"/>
  </owl:Class>
  <owl:Class rdf:ID="SCSIClassic">
    <rdfs:subClassOf rdf:resource="#SCSI"/>
  </owl:Class>
  <owl:Class rdf:ID="SDRAM">
    <rdfs:subClassOf rdf:resource="#MemoryType"/>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="seekTime">
    <rdfs:domain rdf:resource="#HardDisk"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#float"/>
    <rdfs:comment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">measured in
ms</rdfs:comment>
  </owl:DatatypeProperty>
  <PO:Bit_32 rdf:ID="Sempron">
    <PO:hasManufacturer rdf:resource="#AMD_Advanced_Micro_Devices"/>
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</PO:Bit_32>
<owl:Class rdf:ID="Server">
  <rdfs:subClassOf rdf:resource="#ComputerOEM_box"/>
</owl:Class>
<owl:DatatypeProperty rdf:ID="slotParameters">
  <rdfs:domain rdf:resource="#MotherboardExtensionSlot_Port"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<PO:MotherboardCPUSocket rdf:ID="Socket_370">
  <PO:supportedCPU rdf:resource="#Celeron_PIII-based"/>
  <PO:supportedCPU rdf:resource="#Pentium_III"/>
</PO:MotherboardCPUSocket>
<PO:MotherboardCPUSocket rdf:ID="Socket_462">
  <PO:supportedCPU rdf:resource="#Athlon"/>
  <PO:supportedCPU rdf:resource="#Athlon_XP"/>
  <PO:supportedCPU rdf:resource="#Duron"/>
  <PO:supportedCPU rdf:resource="#Sempron"/>
</PO:MotherboardCPUSocket>
<PO:MotherboardCPUSocket rdf:ID="Socket_478">
  <PO:supportedCPU rdf:resource="#Pentium_4"/>
  <PO:supportedCPU rdf:resource="#Celeron_P4-based"/>
</PO:MotherboardCPUSocket>
<PO:MotherboardCPUSocket rdf:ID="Socket_603_604">
  <PO:supportedCPU rdf:resource="#Xeon"/>
</PO:MotherboardCPUSocket>
<PO:MotherboardCPUSocket rdf:ID="Socket_739">
  <PO:supportedCPU rdf:resource="#Athlon_64_FX"/>
</PO:MotherboardCPUSocket>
<PO:MotherboardCPUSocket rdf:ID="Socket_754">
  <PO:supportedCPU rdf:resource="#Athlon_64"/>
</PO:MotherboardCPUSocket>
<PO:MotherboardCPUSocket rdf:ID="Socket_755">
  <PO:supportedCPU rdf:resource="#Pentium_4"/>
</PO:MotherboardCPUSocket>
<PO:MotherboardCPUSocket rdf:ID="Socket_940">
  <PO:supportedCPU rdf:resource="#Athlon_64_FX"/>
</PO:MotherboardCPUSocket>
<owl:Class rdf:ID="SoundCard">
  <rdfs:subClassOf rdf:resource="#ComputerComponent"/>
</owl:Class>
<owl:Class rdf:ID="Speakers">
  <rdfs:subClassOf rdf:resource="#ComputerPeripheral"/>
</owl:Class>
<owl:Class rdf:ID="Standard_Definition_Type"/>
<owl:ObjectProperty rdf:ID="supportedCPU">
  <rdfs:domain rdf:resource="#MotherboardCPUSocket"/>
  <rdfs:range rdf:resource="#CPU"/>
</owl:ObjectProperty>
<owl:Class rdf:ID="SVGA">
  <rdfs:subClassOf rdf:resource="#Video"/>
</owl:Class>
<owl:Class rdf:ID="SXGA">
  <rdfs:subClassOf rdf:resource="#Video"/>
</owl:Class>
<PO:ComputerManufacturer rdf:ID="Toshiba"/>
<owl:DatatypeProperty rdf:ID="type">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#RecommendItem"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="UltraSCSI">
  <rdfs:subClassOf rdf:resource="#SCSI"/>
</owl:Class>
<owl:Class rdf:ID="UltraSCSI160">
  <rdfs:subClassOf rdf:resource="#SCSI"/>
</owl:Class>
<owl:Class rdf:ID="USB">
  <rdfs:subClassOf rdf:resource="#HardDriveConnection"/>
</owl:Class>
<owl:Class rdf:ID="UXGA">
  <rdfs:subClassOf rdf:resource="#Video"/>
</owl:Class>
<owl:Class rdf:ID="Value">
  <rdfs:subClassOf rdf:resource="#VideoCard"/>
</owl:Class>
<owl:DatatypeProperty rdf:ID="vendorName">
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="VGA">
  <rdfs:subClassOf rdf:resource="#Video"/>
</owl:Class>
<owl:Class rdf:ID="Video">
  <rdfs:subClassOf rdf:resource="#Standard_Definition_Type"/>
</owl:Class>
<owl:Class rdf:ID="VideoCard">
  <rdfs:subClassOf rdf:resource="#ComputerComponent"/>
</owl:Class>
<owl:Class rdf:ID="Workstation">
  <rdfs:subClassOf rdf:resource="#ComputerOEM_box"/>
</owl:Class>
<owl:Class rdf:ID="WSXGA">
  <rdfs:subClassOf rdf:resource="#Video"/>
  </owl:Class>
  <owl:Class rdf:ID="WUXGA">
    <rdfs:subClassOf rdf:resource="#Video"/>
  </owl:Class>
  <owl:Class rdf:ID="WXGA">
    <rdfs:subClassOf rdf:resource="#Video"/>
  </owl:Class>
  <PO:Bit_32 rdf:ID="Xeon">
    <PO:hasManufacturer rdf:resource="#Intel"/>
  </PO:Bit_32>
  <owl:Class rdf:ID="XGA">
    <rdfs:subClassOf rdf:resource="#Video"/>
  </owl:Class>
  <owl:Class rdf:ID="XtremePerformance">
    <rdfs:subClassOf rdf:resource="#VideoCard"/>
  </owl:Class>
</rdf:RDF>
```

```
<?xml version="1.0"?>
<rdf:RDF xmlns="http://www.owl-ontologies.com/Ontology1160514425.owl#"
   xml:base="http://www.owl-ontologies.com/BP.owl"
   xmlns:p1="http://protege.stanford.edu/plugins/owl/protege#"
   xmlns:OS="http://www.owl-ontologies.com/Ontology1156787408.owl#"
   xmlns:swrlbImport="http://www.daml.org/rules/proposal/swrlb.owl#"
   xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
   xmlns:BC="http://www.owl-ontologies.com/core.owl#"

xmlns:UP="http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#"
   xmlns:p2="http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#"
   xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
   xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
   xmlns:swrlImport="http://www.daml.org/rules/proposal/swrl.owl#"
   xmlns:foaf="http://xmlns.com/foaf/0.1/"
   xmlns:vs="http://www.w3.org/2003/06/sw-vocab-status/ns#"
   xmlns:owl="http://www.w3.org/2002/07/owl#"
   xmlns:dcterms="http://purl.org/dc/terms/"
   xmlns:xsp="http://www.owl-ontologies.com/2005/08/07/xsp.owl#"
   xmlns:dc="http://purl.org/dc/elements/1.1/"
   xmlns:swrl="http://www.w3.org/2003/11/swrl#"
   xmlns:BP="http://www.owl-ontologies.com/BP.owl#"
   xmlns:daml="http://www.daml.org/2001/03/daml+oil#"
   xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
   xmlns:PO="http://www.owl-ontologies.com/Ontology1156283607.owl#">
   <owl:Ontology rdf:about="">
      <owl:imports rdf:resource="http://purl.org/dc/elements/1.1/"/>
      <owl:imports rdf:resource="http://protege.stanford.edu/plugins/owl/protege"/>
      <owl:imports rdf:resource="http://www.daml.org/rules/proposal/swrlb.owl"/>
      <owl:imports rdf:resource="http://www.daml.org/rules/proposal/swrl.owl"/>
   </owl:Ontology>
   <owl:AllDifferent>
      <owl:distinctMembers rdf:parseType="Collection">
         <rdf:Description rdf:about="#Procurement"/>
         <rdf:Description rdf:about="#Marketing"/>
         <rdf:Description rdf:about="#Inventory"/>
         <rdf:Description rdf:about="#Sales"/>
         <rdf:Description rdf:about="#Finance"/>
         <rdf:Description rdf:about="#Administration"/>
      <rdf:Description rdf:about="#IT"/>
      <rdf:Description rdf:about="#Billing"/>
    </owl:distinctMembers>
  </owl:AllDifferent>
  <owl:AllDifferent>
    <owl:distinctMembers rdf:parseType="Collection"/>
  </owl:AllDifferent>
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  </owl:AllDifferent>
  <owl:AllDifferent>
    <owl:distinctMembers rdf:parseType="Collection"/>
  </owl:AllDifferent>
  <swrl:Variable rdf:ID="x1"/>
  <swrl:Variable rdf:ID="x2"/>
  <swrl:Variable rdf:ID="x3"/>
  <owl:Class rdf:ID="Accounting">
    <rdfs:subClassOf rdf:resource="#finance"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
       >Track financial transactions and investment.</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="activityDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessActivity"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="Actor">
    <rdfs:subClassOf rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#haspriviledge"/>
        <owl:minCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:minCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#actorname"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
       >An actor that participates in a part of the process.An actor can also be a
Process Owner which means that the actor is accountable and responsible for for the
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working and improvement of one of the organizations defined processes and its
related subprocesses.</rdfs:comment>
  </owl:Class>
  <BP:Actor rdf:ID="Actor1">
    <BP:actordescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Marketing Manager responsible to create suggestion for customers for cross
selling in future.</BP:actordescription>
    <BP:actorname
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tedd
Moriss</BP:actorname>
    <BP:hasauthoritytocreate rdf:resource="#BusinessDocument1"/>
    <BP:haspriviledgeover rdf:resource="#BusinessDocument1"/>
    <BP:actsOn rdf:resource="#automatic1"/>
    <BP:isaProcessOwner rdf:resource="#InternalSync1"/>
  </BP:Actor>
  <BP:Actor rdf:ID="Actor2">
    <BP:actorname
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Kevin
Foley</BP:actorname>
  </BP:Actor>
  <BP:Actor rdf:ID="Actor3">
    <BP:actorname
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">TD
morris</BP:actorname>
    <BP:haspriviledgeover rdf:resource="#BusinessArtifact1"/>
  </BP:Actor>
  <owl:DatatypeProperty rdf:ID="actordescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Actor"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="actorname">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Actor"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="actsOn">
    <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
    <rdfs:domain rdf:resource="#Actor"/>
    <rdfs:range rdf:resource="#BusinessActivity"/>
    <owl:inverseOf rdf:resource="#isPerformebByActor"/>
  </owl:ObjectProperty>
  <BP:BusinessProcessContext rdf:ID="Administration"/>
  <owl:Class rdf:ID="administration">
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      <rdfs:subClassOf rdf:resource="#BusinessProcessContext"/>
    </owl:Class>
    <owl:Class rdf:ID="Application">
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >A computer-based system that process business information in support of a
specific business function such as purchasing, accounting or logistics management,
etc. Business application data is produced by such applications.</rdfs:comment>
    </owl:Class>
    <owl:DatatypeProperty rdf:ID="applicationcreationtimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#Application"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="applicationdeletiontimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#Application"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="applicationfunctiondescription">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#Application"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="applicationmodificationtimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#Application"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="associatedWithApplication">
      <rdfs:domain rdf:resource="#BusinessActivity"/>
      <rdfs:range rdf:resource="#Application"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="associatedwithBusinessProcess">
      <rdfs:domain rdf:resource="#BusinessEvent"/>
      <rdfs:range rdf:resource="#BusinessProcess"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="associatedWithService">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#BusinessActivity"/>
      <rdfs:range rdf:resource="#Service"/>
    </owl:ObjectProperty>
    <owl:Class rdf:ID="Asynchronous">
      <rdfs:subClassOf rdf:resource="#BusinessProcess"/>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
```

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        >An asynchronous subprocess needs a trigger tostart.The main process
continues independently of the subprocess.by menas of a special trigger
concept,external events and applications can trigger such a process.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="automatic">
    <rdfs:subClassOf rdf:resource="#BusinessActivity"/>
  </owl:Class>
  <BP:automatic rdf:ID="automatic1">
    <BP:activityDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Conduct Online Customer analysis Interview</BP:activityDescription>
    <BP:preConditionText
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >The Customer is an exsisting Customer</BP:preConditionText>
    <BP:postConditionText
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >The Customer has purchased  more than 10 buys,</BP:postConditionText>
    <BP:hasnextControlFlow rdf:resource="#sequence2"/>
    <BP:associatedWithService rdf:resource="#OnlineSalesPromotion"/>
    <BP:isPerformebByActor rdf:resource="#Actor1"/>
  </BP:automatic>
  <BP:automatic rdf:ID="automatic2">
    <BP:activityDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Match pssible sale on the basis of product/services checklist and customer
product category etc.</BP:activityDescription>
    <BP:interactswithBusinessArtifact rdf:resource="#BusinessDocument1"/>
    <BP:interactswithBusinessArtifact rdf:resource="#BusinessDocument2"/>
    <BP:hasnextControlFlow rdf:resource="#sequence5"/>
    <BP:associatedWithService rdf:resource="#ProuctMatchingService"/>
  </BP:automatic>
  <owl:ObjectProperty rdf:ID="belongsto">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcess"/>
    <rdfs:range rdf:resource="#BusinessProcessContext"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="belongstoActivityType"/>
  <owl:ObjectProperty rdf:ID="belongstoBusinessContext">
    <rdfs:domain rdf:resource="#BusinessActivity"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="belongstoBusinesscontext">
    <rdfs:range rdf:resource="#BusinessProcessContext"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="belongstobusinesscontext">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessArtifact"/>
  <rdfs:range rdf:resource="#BusinessProcessContext"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="belongstoBusinessProcess">
  <rdfs:range rdf:resource="#BusinessProcess"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="benefitsfrom">
  <rdfs:range>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
        <owl:Class rdf:about="#BusinessActivity"/>
        <owl:Class rdf:about="#BusinessProcess"/>
      </owl:unionOf>
    </owl:Class>
  </rdfs:range>
</owl:ObjectProperty>
<BP:BusinessProcessContext rdf:ID="Billing"/>
<owl:Class rdf:ID="billing">
  <rdfs:subClassOf rdf:resource="#BusinessProcessContext"/>
</owl:Class>
<owl:DatatypeProperty rdf:ID="BPDCreationTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessProcessDiagram"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="BPDDeletionTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessProcessDiagram"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="BPDModificationTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessProcessDiagram"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="Branch">
  <rdfs:subClassOf rdf:resource="#BusinessProcessControlFlow"/>
</owl:Class>
<owl:ObjectProperty rdf:ID="broader"/>
<owl:DatatypeProperty rdf:ID="BuinessProcessCycleTime">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessProcess"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#time"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="BusinessActivity">
  <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
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        >An atomic unit of work in the context of a business process,which is
performed by a role,has  a specific context and must  not be
interrupted.</rdfs:comment>
  </owl:Class>
  <BP:BusinessActivity rdf:ID="BusinessActivity1"/>
  <BP:BusinessActivity rdf:ID="BusinessActivity2">
    <BP:generatesBusinessArtifact rdf:resource="#BusinessDocument1"/>
    <BP:belongstoBusinessContext rdf:resource="#Finance"/>
  </BP:BusinessActivity>
  <owl:DatatypeProperty rdf:ID="businessActivityCreatedBy">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessactivitytypeDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessapplicationname">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Application"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="BusinessArtifact">
    <rdfs:subClassOf rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#businessartifactname"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >A physical or logical object of significance to a business; for example, a
sales order, department,resource etc.</rdfs:comment>
  </owl:Class>
  <BP:BusinessArtifact rdf:ID="BusinessArtifact1">
    <BP:businessartifactname
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">PSD
Document</BP:businessartifactname>
    <BP:isusedin rdf:resource="#BusinessActivity1"/>
  </BP:BusinessArtifact>
  <owl:DatatypeProperty rdf:ID="businessartifactCreationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessArtifact"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
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<owl:DatatypeProperty rdf:ID="businessartifactDeletionTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessArtifact"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="businessartifactDescription">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessArtifact"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="businessartifactModificationTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessArtifact"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="businessartifactname">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessArtifact"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="BusinessContextDescription">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessProcessContext"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:Class rdf:ID="BusinessDocument">
  <rdfs:subClassOf rdf:resource="#BusinessArtifact"/>
</owl:Class>
<BP:BusinessDocument rdf:ID="BusinessDocument1">
  <BP:businessartifactname
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
    >CSS Review 04/06</BP:businessartifactname>
  <BP:isgeneratedasaresultof rdf:resource="#OnlineSalesPromotion"/>
  <BP:isrequiredbyBusinessProcess rdf:resource="#InternalSync1"/>
  <BP:isusedin rdf:resource="#automatic1"/>
  <BP:canbemodifiedby rdf:resource="#Actor1"/>
</BP:BusinessDocument>
<BP:BusinessDocument rdf:ID="BusinessDocument2">
  <BP:businessartifactname
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
    >Product and Services Checklist</BP:businessartifactname>
  <BP:businessartifactModificationTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
    >2006-09-05T00:00:00</BP:businessartifactModificationTimestamp>
</BP:BusinessDocument>
<owl:Class rdf:ID="BusinessEvent">
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    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >A business event is a action which causes the trigger for a busines process.A
start event marks the start of process and the end event marks the end of the
process.</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="businesseventdescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessEvent"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="BusinessProcess">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasBusinessProcessObjective"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#hasBusinessProcessGoal"/>
        <owl:minCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:minCardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#BuinessProcessCycleTime"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#processName"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#interactswithBusinessArtifact"/>
        <owl:minCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:minCardinality>
      </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#hasBusinessProcessDiagram"/>
          <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >The top level definition of the overall process model
It is a set of activities that produces products and services for customers.
A Business Process contains many Subprocesses and activities.A subprocess is a
collection of related activities and tasks within a process

A business Process or subprocess can be of different types based on the type of
busines interactions they perform(internal,external) or the time
dependencies(sync/async).</rdfs:comment>
    </owl:Class>
    <owl:Class rdf:ID="BusinessProcessContext">
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >These are the categories which describe the area under which a specific
Business Process executes , for e.g.
&quot;Procurement&quot;,&quot;Sales&quot;.</rdfs:comment>
    </owl:Class>
    <owl:Class rdf:ID="BusinessProcessControlFlow">
      <rdfs:subClassOf rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#controlflowname"/>
          <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >A construct specifying the order in which actions should be
performed.</rdfs:comment>
    </owl:Class>
    <owl:DatatypeProperty rdf:ID="businessprocessCreationTimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#BusinessProcess"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="businessprocessDeletionTimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#BusinessProcess"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
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  </owl:DatatypeProperty>
  <owl:Class rdf:ID="BusinessProcessDiagram">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#BusinessProcessDiagramName"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >It is the static descritption of the flow of events in a business process.Also
called as workflow diagram.</rdfs:comment>
  </owl:Class>
  <BP:BusinessProcessDiagram rdf:ID="BusinessProcessDiagram1">
    <BP:BusinessProcessDiagramName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >CrossSellingProcessDiagram</BP:BusinessProcessDiagramName>
    <BP:BPDDeletionTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
      >2010-09-23T00:00:00</BP:BPDDeletionTimestamp>
  </BP:BusinessProcessDiagram>
  <owl:DatatypeProperty rdf:ID="BusinessProcessDiagramDescription.">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcessDiagram"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="BusinessProcessDiagramName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcessDiagram"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="BusinessProcessGoal">
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >A business process goal is nothing but a statement of business process
intent.</rdfs:comment>
  </owl:Class>
  <BP:BusinessProcessGoal rdf:ID="BusinessProcessGoal1">
    <BP:GoalDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >The Goal of this Business Process is to Enable Cross
Selling.</BP:GoalDescription>
  </BP:BusinessProcessGoal>
  <owl:DatatypeProperty rdf:ID="businessprocessModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcess"/>
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      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
    </owl:DatatypeProperty>
    <owl:Class rdf:ID="BusinessProcessObjective">
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >A business process objective is something theprocess is aiming toward or it
is working to attain. Usually it is a step in the strategy. Objectives are similar to goals,
but often have success/failure rather than quantifiable metrics.</rdfs:comment>
    </owl:Class>
    <BP:BusinessProcessObjective rdf:ID="BusinessProcessObjective1">
      <BP:hasdescripton rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >The Objective  of this Business Process is to Enable Cross Selling In order to
get more business from the current clients.</BP:hasdescripton>
    </BP:BusinessProcessObjective>
    <owl:Class rdf:ID="BusinessProcessPattern">
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#processpatternname"/>
          <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >A Business Process Pattern is a frequently occuring sequence of actions
which can be reused and thus will save time and cost of modelling.It defines a
reocurring portion of process flow or reocuuring relationships between process
tasks.</rdfs:comment>
    </owl:Class>
    <owl:ObjectProperty rdf:ID="canbemodifiedby">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#BusinessArtifact"/>
      <rdfs:range rdf:resource="#Actor"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="consistsofFlowType"/>
    <owl:DatatypeProperty rdf:ID="controlflowdescription">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#BusinessProcessControlFlow"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="controlflowname">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#BusinessProcessControlFlow"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="createsbusinessartifact">
      <rdfs:range rdf:resource="#BusinessArtifact"/>
```

```
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="createsservice">
    <rdfs:domain rdf:resource="#BusinessProcess"/>
    <rdfs:range rdf:resource="#Service"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="createsValuefor">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcess"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="cui"/>
  <owl:DatatypeProperty rdf:ID="customerDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="customername">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="CustomerService">
    <rdfs:subClassOf rdf:resource="#BusinessProcessContext"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Answer questions ans solve problems related to internal clients and external
customers.</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="DatatypeProperty_19">
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="DatatypeProperty_38"/>
  <owl:Class rdf:ID="Delivery">
    <rdfs:subClassOf rdf:resource="#Production"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Recieve,fulfill and track shipments.</rdfs:comment>
  </owl:Class>
  <BP:TechnicalService rdf:ID="DemandForecasting"/>
  <owl:ObjectProperty rdf:ID="documentation"/>
  <owl:ObjectProperty rdf:ID="effects">
    <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcess"/>
    <owl:inverseOf rdf:resource="#iseffectedby"/>
  </owl:ObjectProperty>
  <owl:Class rdf:ID="ExternalAsync">
    <rdfs:subClassOf rdf:resource="#Asynchronous"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >An external business process is a type of business process through which
business partners conduct business amongst themselves externally say via e-
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business.Such a public/external process will in turn interface with an internal
process.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="ExternalService">
    <rdfs:subClassOf rdf:resource="#Service"/>
  </owl:Class>
  <owl:Class rdf:ID="ExternalSync">
    <rdfs:subClassOf rdf:resource="#Synchronous"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >An external business process is a type of business process through which
business partners conduct business amongst themselves externally say via e-
business.Such a public/external process will in turn interface with an internal
process.</rdfs:comment>
  </owl:Class>
  <BP:BusinessProcessContext rdf:ID="Finance"/>
  <owl:Class rdf:ID="finance">
    <rdfs:subClassOf rdf:resource="#BusinessProcessContext"/>
  </owl:Class>
  <owl:ObjectProperty rdf:ID="fulfills">
    <rdfs:domain rdf:resource="#BusinessProcessObjective"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="generatedby">
    <rdfs:domain rdf:resource="#Trigger"/>
    <rdfs:range>
      <owl:Class>
        <owl:unionOf rdf:parseType="Collection">
          <owl:Class rdf:about="#Application"/>
          <owl:Class rdf:about="#BusinessEvent"/>
        </owl:unionOf>
      </owl:Class>
    </rdfs:range>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="generates">
    <rdfs:range rdf:resource="#BusinessArtifact"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="generatesBusinessArtifact">
    <rdfs:domain rdf:resource="#BusinessActivity"/>
    <rdfs:range rdf:resource="#BusinessArtifact"/>
  </owl:ObjectProperty>
  <swrl:Imp rdf:ID="Rule-3">
    <swrl:head>
      <rdf:List>
        <rdf:first>
          <rdf:Description>
            <rdf:type
 rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
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              <swrl:argument2 rdf:resource="#x3"/>
              <swrl:argument1 rdf:resource="#x2"/>
              <swrl:propertyPredicate rdf:resource="#belongstobusinesscontext"/>
            </rdf:Description>
          </rdf:first>
          <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#nil"/>
        </rdf:List>
      </swrl:head>
      <swrl:body>
        <rdf:List>
          <rdf:first>
            <rdf:Description>
              <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
              <swrl:argument2 rdf:resource="#x2"/>
              <swrl:argument1 rdf:resource="#x1"/>
              <swrl:propertyPredicate rdf:resource="#generatesBusinessArtifact"/>
            </rdf:Description>
          </rdf:first>
          <rdf:rest>
            <rdf:List>
              <rdf:first>
                <rdf:Description>
                  <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
                  <swrl:argument2 rdf:resource="#x3"/>
                  <swrl:argument1 rdf:resource="#x1"/>
                  <swrl:propertyPredicate
rdf:resource="#belongstoBusinessContext"/>
                </rdf:Description>
              </rdf:first>
              <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#nil"/>
            </rdf:List>
          </rdf:rest>
        </rdf:List>
      </swrl:body>
    </swrl:Imp>
    <owl:ObjectProperty rdf:ID="generatesBusinessObject">
      <rdfs:range rdf:resource="#BusinessArtifact"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="generatestrigger">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#BusinessEvent"/>
      <rdfs:range rdf:resource="#Trigger"/>
    </owl:ObjectProperty>
```

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<owl:DatatypeProperty rdf:ID="GoalDescription">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessProcessGoal"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="hasauthoritytocreate">
  <rdfs:domain rdf:resource="#Actor"/>
  <rdfs:range rdf:resource="#BusinessArtifact"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasBusinessActivity">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#sequence"/>
  <rdfs:range rdf:resource="#BusinessActivity"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasBusinessactivity">
  <rdfs:range rdf:resource="#BusinessActivity"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasbusinessActivity">
  <rdfs:domain rdf:resource="#Branch"/>
  <rdfs:range rdf:resource="#BusinessActivity"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasbusinessactivity">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#Iteration"/>
  <rdfs:range rdf:resource="#BusinessActivity"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasbusinessactivitytype">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasbusinesscontext">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="#BusinessProcessContext"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasBusinessProcessDiagram">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessProcess"/>
  <rdfs:range rdf:resource="#BusinessProcessDiagram"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasBusinessProcessGoal">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessProcess"/>
  <rdfs:range rdf:resource="#BusinessProcessGoal"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasBusinessProcessObjective">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessProcess"/>
  <rdfs:range rdf:resource="#BusinessProcessObjective"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasBusinessProcessType">
  <rdfs:domain rdf:resource="#BusinessProcess"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasCondition"/>
<owl:DatatypeProperty rdf:ID="hascondition">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#Iteration"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="hascontrolflow">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
        <owl:Class rdf:about="#BusinessProcess"/>
        <owl:Class rdf:about="http://www.w3.org/2002/07/owl#Thing"/>
      </owl:unionOf>
    </owl:Class>
  </rdfs:domain>
  <rdfs:range rdf:resource="#BusinessProcessControlFlow"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasCycletime"/>
<owl:DatatypeProperty rdf:ID="hasdescripton">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessProcessObjective"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="hasEndEvent">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="#StopEvent"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasflowscenario">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessProcess"/>
  <rdfs:range rdf:resource="#BusinessProcessControlFlow"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasflowtype">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasnextActivity">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="#BusinessActivity"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasnextControlFlow">
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    <rdfs:domain rdf:resource="#BusinessActivity"/>
    <rdfs:range rdf:resource="#BusinessProcessControlFlow"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="haspostcondition">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcess"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="hasprecondition">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcess"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="haspriviledge">
    <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
    <rdfs:domain rdf:resource="#Actor"/>
    <owl:inverseOf rdf:resource="#isgivento"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="haspriviledgeover">
    <rdfs:domain rdf:resource="#Actor"/>
    <rdfs:range rdf:resource="#BusinessArtifact"/>
  </owl:ObjectProperty>
  <swrl:Imp rdf:ID="Rule-1">
    <swrl:head>
      <rdf:List>
        <rdf:first>
          <rdf:Description>
            <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
            <swrl:argument2 rdf:resource="#x3"/>
            <swrl:argument1 rdf:resource="#x1"/>
            <swrl:propertyPredicate rdf:resource="#isapartof"/>
          </rdf:Description>
        </rdf:first>
        <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#nil"/>
      </rdf:List>
    </swrl:head>
    <swrl:body>
      <rdf:List>
        <rdf:first>
          <rdf:Description>
            <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
            <swrl:argument2 rdf:resource="#x2"/>
            <swrl:argument1 rdf:resource="#x1"/>
            <swrl:propertyPredicate rdf:resource="#haspriviledgeover"/>
          </rdf:Description>
        </rdf:first>
        <rdf:rest>
          <rdf:List>
            <rdf:first>
              <rdf:Description>
                <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
                <swrl:argument2 rdf:resource="#x3"/>
                <swrl:argument1 rdf:resource="#x2"/>
                <swrl:propertyPredicate rdf:resource="#isusedin"/>
              </rdf:Description>
            </rdf:first>
            <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#nil"/>
          </rdf:List>
        </rdf:rest>
      </rdf:List>
    </swrl:body>
  </swrl:Imp>
  <owl:ObjectProperty rdf:ID="hasproductsforsale">
    <rdfs:domain rdf:resource="#sales"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="hasselectioncondition">
    <rdfs:range>
      <owl:DataRange>
        <owl:oneOf>
          <rdf:List>
            <rdf:first
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">paperformat</rdf:first>
          <rdf:rest>
              <rdf:List>
                <rdf:first
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
                  >elelctronicformat</rdf:first>
                <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdf-
syntax-ns#nil"/>
              </rdf:List>
            </rdf:rest>
          </rdf:List>
        </owl:oneOf>
      </owl:DataRange>
    </rdfs:range>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="hasStartEvent">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="#StartEvent"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasstartevent">
  <rdfs:domain rdf:resource="#Synchronous"/>
  <rdfs:range rdf:resource="#StartEvent"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasstopevent">
  <rdfs:domain rdf:resource="#Synchronous"/>
  <rdfs:range rdf:resource="#StopEvent"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="hasSubProcess">
  <rdfs:domain rdf:resource="#BusinessProcess"/>
  <owl:inverseOf rdf:resource="#isaSubProcessof"/>
</owl:ObjectProperty>
<owl:Class rdf:ID="HumanReources">
  <rdfs:subClassOf rdf:resource="#administration"/>
  <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
    >Hire Employees,managae benefits and payrolls.</rdfs:comment>
</owl:Class>
<owl:Class rdf:ID="InformationService">
  <rdfs:subClassOf rdf:resource="#InternalService"/>
</owl:Class>
<owl:ObjectProperty rdf:ID="interactswithBusinessArtifact">
  <rdfs:domain>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
        <owl:Class rdf:about="#Asynchronous"/>
        <owl:Class rdf:about="#BusinessActivity"/>
        <owl:Class rdf:about="#BusinessProcess"/>
      </owl:unionOf>
    </owl:Class>
  </rdfs:domain>
  <rdfs:range rdf:resource="#BusinessArtifact"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="interactsWithBusinessEvent">
  <rdfs:range rdf:resource="#BusinessEvent"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="interactsWithBusinessObject">
  <rdfs:range rdf:resource="#BusinessArtifact"/>
  <owl:inverseOf rdf:resource="#isgeneratedasaresultof"/>
</owl:ObjectProperty>
<owl:Class rdf:ID="InternalAsync">
  <rdfs:subClassOf rdf:resource="#Asynchronous"/>
  <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
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        >An internal process is controlled fully and only by the organization itself.It
may involve interactions with external entities like business partners etc.An internal
businessProcess may invoke services on external systems(e.g. through a web service
interface)</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="InternalService">
    <rdfs:subClassOf rdf:resource="#Service"/>
  </owl:Class>
  <owl:Class rdf:ID="InternalSync">
    <rdfs:subClassOf rdf:resource="#Synchronous"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >An internal process is controlled fully and only by the organization itself.It
may involve interactions with external entities like business partners etc.An internal
businessProcess may invoke services on external systems(e.g. through a web service
interface)</rdfs:comment>
  </owl:Class>
  <BP:InternalSync rdf:ID="InternalSync1">
    <BP:businessprocessModificationTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
        >2006-09-05T00:00:00</BP:businessprocessModificationTimestamp>
    <BP:businessprocessCreationTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
        >2006-09-05T00:00:00</BP:businessprocessCreationTimestamp>
    <BP:hasprecondition
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >The Targetted customers are exsisting customers.</BP:hasprecondition>
    <BP:processName rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >EnableCrossSelling</BP:processName>
    <BP:processDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Sales Person will collect and input general client charcteristics,which will be
then used to match clients to products.The idea is to promote Cross-Selling by using
IT to identify products similar to those purchased earlier by the customer.It&apos;s a
proactive, ongoing sales process designed to provide your existing customers with a
full range of your company&apos;s products and services.</BP:processDescription>
    <BP:hasBusinessProcessGoal rdf:resource="#BusinessProcessGoal1"/>
    <BP:interactswithBusinessArtifact rdf:resource="#BusinessDocument2"/>
    <BP:interactswithBusinessArtifact rdf:resource="#BusinessDocument1"/>
    <BP:hasstartevent rdf:resource="#StartEvent1"/>
    <BP:hasflowscenario rdf:resource="#sequence1"/>
    <BP:belongsto rdf:resource="#Marketing"/>
    <BP:isownedbya rdf:resource="#Actor1"/>
    <BP:hasBusinessProcessDiagram rdf:resource="#BusinessProcessDiagram1"/>
    <BP:hasBusinessProcessObjective
rdf:resource="#BusinessProcessObjective1"/>
  </BP:InternalSync>
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<BP:BusinessProcessContext rdf:ID="Inventory"/>
<owl:Class rdf:ID="inventory">
  <rdfs:subClassOf rdf:resource="#BusinessProcessContext"/>
</owl:Class>
<BP:TechnicalService rdf:ID="InventoryControl"/>
<owl:ObjectProperty rdf:ID="inverse_of_actsOn">
  <rdfs:range rdf:resource="#Actor"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isapartof">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#Actor"/>
  <rdfs:range>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
        <owl:Class rdf:about="#BusinessActivity"/>
        <owl:Class rdf:about="#BusinessProcess"/>
      </owl:unionOf>
    </owl:Class>
  </rdfs:range>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isaProcessOwner">
  <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
  <rdfs:domain rdf:resource="#Actor"/>
  <owl:inverseOf rdf:resource="#isownedbya"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isassociatedwith">
  <rdfs:domain rdf:resource="#BusinessProcessPattern"/>
  <rdfs:range rdf:resource="#BusinessProcess"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isaSubProcessof">
  <rdfs:range rdf:resource="#BusinessProcess"/>
  <owl:inverseOf rdf:resource="#hasSubProcess"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isasubprocessof">
  <rdfs:domain rdf:resource="#BusinessProcess"/>
  <rdfs:range rdf:resource="#BusinessProcess"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isatypeof">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#Actor"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="iscollectionof">
  <rdfs:domain rdf:resource="#BusinessProcessPattern"/>
  <rdfs:range>
    <owl:Class>
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      <owl:unionOf rdf:parseType="Collection">
        <owl:Class rdf:about="#BusinessActivity"/>
        <owl:Class rdf:about="#BusinessProcess"/>
      </owl:unionOf>
    </owl:Class>
  </rdfs:range>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="iscreatedasaresultof">
  <rdfs:range>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
        <owl:Class rdf:about="#BusinessActivity"/>
        <owl:Class rdf:about="#BusinessProcess"/>
      </owl:unionOf>
    </owl:Class>
  </rdfs:range>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="iseffectedby">
  <rdfs:range rdf:resource="#BusinessProcess"/>
  <owl:inverseOf rdf:resource="#effects"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isgeneratedasaresultof">
  <rdfs:domain rdf:resource="#BusinessArtifact"/>
  <owl:inverseOf rdf:resource="#interactsWithBusinessObject"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isgivento">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="#Actor"/>
  <owl:inverseOf rdf:resource="#haspriviledge"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isnotapartof">
  <rdfs:range rdf:resource="#BusinessArtifact"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isownedbya">
  <rdfs:range rdf:resource="#Actor"/>
  <owl:inverseOf rdf:resource="#isaProcessOwner"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="ispartof">
  <rdfs:range rdf:resource="#BusinessArtifact"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isPerformebByActor">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#BusinessActivity"/>
  <rdfs:range rdf:resource="#Actor"/>
  <owl:inverseOf rdf:resource="#actsOn"/>
</owl:ObjectProperty>
```

```
<owl:ObjectProperty rdf:ID="isproducedasaresultof">
  <rdfs:domain rdf:resource="#Service"/>
  <rdfs:range>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
        <owl:Class rdf:about="#BusinessActivity"/>
        <owl:Class rdf:about="#BusinessProcess"/>
      </owl:unionOf>
    </owl:Class>
  </rdfs:range>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isrequiredby">
  <rdfs:range rdf:resource="#BusinessActivity"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isrequiredbyBusinessAcitvity">
  <rdfs:domain rdf:resource="#BusinessDocument"/>
  <rdfs:range rdf:resource="#BusinessArtifact"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isRequiredByBusinessProcess">
  <rdfs:range rdf:resource="#BusinessProcess"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isrequiredbyBusinessProcess">
  <rdfs:domain rdf:resource="#BusinessDocument"/>
  <rdfs:range rdf:resource="#BusinessProcess"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="istriggeredby">
  <rdfs:domain rdf:resource="#Asynchronous"/>
  <rdfs:range rdf:resource="#Trigger"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isusedby">
  <rdfs:domain rdf:resource="#Service"/>
  <rdfs:range>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
        <owl:Class rdf:about="#Actor"/>
        <owl:Class rdf:about="#Application"/>
        <owl:Class rdf:about="#BusinessActivity"/>
      </owl:unionOf>
    </owl:Class>
  </rdfs:range>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="isusedin">
  <rdfs:domain rdf:resource="#BusinessArtifact"/>
  <rdfs:range>
    <owl:Class>
      <owl:unionOf rdf:parseType="Collection">
```

```
            <owl:Class rdf:about="#BusinessActivity"/>
            <owl:Class rdf:about="#BusinessProcess"/>
          </owl:unionOf>
        </owl:Class>
      </rdfs:range>
    </owl:ObjectProperty>
    <BP:BusinessProcessContext rdf:ID="IT"/>
    <owl:Class rdf:ID="Iteration">
      <rdfs:subClassOf rdf:resource="#BusinessProcessControlFlow"/>
    </owl:Class>
    <owl:Class rdf:ID="manual">
      <rdfs:subClassOf rdf:resource="#BusinessActivity"/>
    </owl:Class>
    <BP:BusinessProcessContext rdf:ID="Marketing"/>
    <owl:Class rdf:ID="marketing">
      <rdfs:subClassOf rdf:resource="#BusinessProcessContext"/>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Promotes goods and services.</rdfs:comment>
    </owl:Class>
    <owl:Class rdf:ID="MarketingService">
      <rdfs:subClassOf rdf:resource="#InternalService"/>
    </owl:Class>
    <owl:ObjectProperty rdf:ID="name"/>
    <owl:ObjectProperty rdf:ID="narrower"/>
    <owl:ObjectProperty rdf:ID="nextcontrolflow">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:range rdf:resource="#BusinessProcessControlFlow"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="nextsubprocess">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#BusinessProcessControlFlow"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="ObjectProperty_2"/>
    <owl:ObjectProperty rdf:ID="ObjectProperty_24"/>
    <owl:ObjectProperty rdf:ID="ObjectProperty_4"/>
    <owl:ObjectProperty rdf:ID="ObjectProperty_8"/>
    <BP:InformationService rdf:ID="OnlineSalesPromotion">
      <BP:interactsWithBusinessObject rdf:resource="#BusinessDocument1"/>
      <BP:isusedby rdf:resource="#automatic1"/>
    </BP:InformationService>
    <owl:ObjectProperty rdf:ID="partofBusinessProcess">
      <rdfs:domain rdf:resource="#Application"/>
      <rdfs:range rdf:resource="#BusinessProcess"/>
    </owl:ObjectProperty>
    <owl:DatatypeProperty rdf:ID="partOfEnumeratedClass">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:subPropertyOf rdf:resource="#partOfPattern"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="partOfPattern">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="performedByOrganisationUnit">
    <rdfs:domain rdf:resource="#BusinessActivity"/>
  </owl:ObjectProperty>
  <owl:Class rdf:ID="PermanentResource">
    <rdfs:subClassOf rdf:resource="#PhysicalResource"/>
  </owl:Class>
  <owl:Class rdf:ID="PhysicalResource">
    <rdfs:subClassOf rdf:resource="#BusinessArtifact"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >A resource item that is required or produced by Business activity or process
like printer or other physical resources etc.</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="postConditionText">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessActivity"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Invariant rule that is the post condition/effect of the business
activity.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="preConditionText">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessActivity"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="processDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcess"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="processName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcess"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="processpatternCreationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcessPattern"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="processpatternDeletionTimestamp">
```

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    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcessPattern"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="processpatterndesciption">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcessPattern"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="processpatternModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcessPattern"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="processpatternname">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessProcessPattern"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <BP:BusinessProcessContext rdf:ID="Procurement"/>
  <owl:Class rdf:ID="procurement">
    <rdfs:subClassOf rdf:resource="#Production"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Obtains resources and materials</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="productDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="ProductDevelopment">
    <rdfs:subClassOf rdf:resource="#technology"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Plan,design and refine goods and services.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="Production">
    <rdfs:subClassOf rdf:resource="#BusinessProcessContext"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Manufacture and provide goods or services.</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="productname">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <BP:InformationService rdf:ID="ProuctMatchingService"/>
  <BP:TechnicalService rdf:ID="QualityControl"/>
  <owl:ObjectProperty rdf:ID="related_slot"/>
```

```
<owl:ObjectProperty rdf:ID="requiredbyBusinessActivity">
   <rdfs:domain rdf:resource="#Application"/>
   <rdfs:range rdf:resource="#BusinessActivity"/>
</owl:ObjectProperty>
<BP:BusinessProcessContext rdf:ID="Sales"/>
<owl:Class rdf:ID="sales">
   <rdfs:subClassOf rdf:resource="#BusinessProcessContext"/>
</owl:Class>
<owl:ObjectProperty rdf:ID="semantic_type"/>
<owl:Class rdf:ID="semi-automatic">
   <rdfs:subClassOf rdf:resource="#BusinessActivity"/>
</owl:Class>
<BP:semi-automatic rdf:ID="semi-automatic1">
   <BP:activityDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Review Customer Satisfaction Survery Results.</BP:activityDescription>
   <BP:hasnextControlFlow rdf:resource="#sequence3"/>
</BP:semi-automatic>
<BP:semi-automatic rdf:ID="semi-automatic2">
   <BP:activityDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Review Customer Information Database</BP:activityDescription>
   <BP:hasnextControlFlow rdf:resource="#sequence4"/>
</BP:semi-automatic>
<BP:semi-automatic rdf:ID="semi-automatic3">
   <BP:activityDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Use generated information for online promotions as well as by Marketing
Specialists for Increase in Contracts.</BP:activityDescription>
</BP:semi-automatic>
<owl:Class rdf:ID="sequence">
   <rdfs:subClassOf rdf:resource="#BusinessProcessControlFlow"/>
</owl:Class>
<BP:sequence rdf:ID="sequence1">
   <BP:controlflowname
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">CrossSell1</BP:contro
lflowname>
   <BP:hasBusinessActivity rdf:resource="#automatic1"/>
</BP:sequence>
<BP:sequence rdf:ID="sequence2">
   <BP:controlflowname
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">CrossSell2</BP:contro
lflowname>
   <BP:hasBusinessActivity rdf:resource="#semi-automatic1"/>
</BP:sequence>
<BP:sequence rdf:ID="sequence3">
```

```
      <BP:controlflowname
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">CrossSell3</BP:contro
lflowname>
      <BP:hasBusinessActivity rdf:resource="#semi-automatic2"/>
    </BP:sequence>
    <BP:sequence rdf:ID="sequence4">
      <BP:controlflowname
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">CrossSell4</BP:contro
lflowname>
      <BP:hasBusinessActivity rdf:resource="#automatic2"/>
    </BP:sequence>
    <BP:sequence rdf:ID="sequence5">
      <BP:controlflowname
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">CrossSell5</BP:contro
lflowname>
      <BP:hasBusinessActivity rdf:resource="#semi-automatic3"/>
    </BP:sequence>
    <owl:Class rdf:ID="Service">
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >In the context of SOA, a service is a self contained business function in
which consumers interact through a well defined interface (contract). The consumer
does not know (or care) &quot;how&quot; the service implements the requested
business action - only that the service performs &quot;what&quot; is defined by its
published interface (contract).</rdfs:comment>
    </owl:Class>
    <owl:Class rdf:ID="StartEvent">
      <rdfs:subClassOf rdf:resource="#BusinessEvent"/>
    </owl:Class>
    <BP:StartEvent rdf:ID="StartEvent1"/>
    <owl:DatatypeProperty rdf:ID="starteventDescription">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#StartEvent"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="StartEventEndingTimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#StartEvent"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="StartEventStartingTimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#StartEvent"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
    </owl:DatatypeProperty>
    <owl:Class rdf:ID="StopEvent">
      <rdfs:subClassOf rdf:resource="#BusinessEvent"/>
```

```
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="stopeventDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#StopEvent"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="StopEventEndingTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#StopEvent"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="StopEventStartingTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#StopEvent"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="supports">
    <rdfs:domain rdf:resource="#BusinessProcessGoal"/>
  </owl:ObjectProperty>
  <owl:Class rdf:ID="Synchronous">
    <rdfs:subClassOf rdf:resource="#BusinessProcess"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >A Synchronous subprocess needs to be started.The main process stops and
continues when the subprocess has been completed.</rdfs:comment>
  </owl:Class>
  <owl:ObjectProperty rdf:ID="synonym"/>
  <owl:Class rdf:ID="TechnicalService">
    <rdfs:subClassOf rdf:resource="#InternalService"/>
  </owl:Class>
  <owl:Class rdf:ID="technology">
    <rdfs:subClassOf rdf:resource="#BusinessProcessContext"/>
  </owl:Class>
  <owl:Class rdf:ID="TemporaryResource">
    <rdfs:subClassOf rdf:resource="#PhysicalResource"/>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="timeToPerform">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#BusinessActivity"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#duration"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="Trigger"/>
  <owl:DatatypeProperty rdf:ID="triggerDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Trigger"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="triggergeneratedTimeStamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#Trigger"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="triggers">
    <rdfs:domain rdf:resource="#Trigger"/>
    <rdfs:range rdf:resource="#Asynchronous"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="usedbyOrganisationUnit">
    <rdfs:domain rdf:resource="#Application"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="uses">
    <rdfs:range rdf:resource="#BusinessArtifact"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="usesBusinessArtifact">
    <rdfs:range rdf:resource="#BusinessArtifact"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="usesBusinessObject">
    <rdfs:range rdf:resource="#BusinessArtifact"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="usesResource"/>
  <owl:ObjectProperty rdf:ID="usesservice">
    <rdfs:domain rdf:resource="#BusinessProcess"/>
    <rdfs:range rdf:resource="#Service"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="waitsforBusinessArtifact">
    <rdfs:range rdf:resource="#BusinessArtifact"/>
  </owl:ObjectProperty>
</rdf:RDF>
```

```
<?xml version="1.0"?>
<rdf:RDF xmlns="http://www.owl-ontologies.com/Ontology1160514425.owl#"
   xml:base="http://protege.stanford.edu/plugins/owl/protege"
   xmlns:p1="http://protege.stanford.edu/plugins/owl/protege#"
   xmlns:OS="http://www.owl-ontologies.com/Ontology1156787408.owl#"
   xmlns:swrlbImport="http://www.daml.org/rules/proposal/swrlb.owl#"
   xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
   xmlns:BC="http://www.owl-ontologies.com/core.owl#"

xmlns:UP="http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#"
   xmlns:p2="http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#"
   xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
   xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
   xmlns:swrlImport="http://www.daml.org/rules/proposal/swrl.owl#"
   xmlns:foaf="http://xmlns.com/foaf/0.1/"
   xmlns:vs="http://www.w3.org/2003/06/sw-vocab-status/ns#"
   xmlns:owl="http://www.w3.org/2002/07/owl#"
   xmlns:dcterms="http://purl.org/dc/terms/"
   xmlns:xsp="http://www.owl-ontologies.com/2005/08/07/xsp.owl#"
   xmlns:dc="http://purl.org/dc/elements/1.1/"
   xmlns:swrl="http://www.w3.org/2003/11/swrl#"
   xmlns:BP="http://www.owl-ontologies.com/BP.owl#"
   xmlns:daml="http://www.daml.org/2001/03/daml+oil#"
   xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
   xmlns:PO="http://www.owl-ontologies.com/Ontology1156283607.owl#">
  <owl:Ontology rdf:about="">
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >The Protege metadata ontology (in the version that is used inside Protege.
Note that this is an OWL Full ontology, with annotation properties that have range
```

```
and domain restrictions. However, the &quot;official&quot; online release of this file
is OWL DL, so that ontologies that use Protege metadata annotations can still be
shared as OWL DL.</rdfs:comment>
  </owl:Ontology>
  <owl:DatatypeProperty rdf:ID="abstract">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-schema#Class"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#boolean"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Specifies whether a class can have instances (false) or not (true). This
corresponds to the notion of abstract classes in general Protege or object-oriented
languages.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="allowedParent">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#Property"/>
    <rdfs:range rdf:resource="http://www.w3.org/2002/07/owl#Class"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Stores the allowed parents of a Class property. All values of the annotated
property must be subclasses of one of the allowed parents.</rdfs:comment>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="defaultLanguage">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2002/07/owl#Ontology"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Specifies the default language used for new string values in this
ontology.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="excludedTest">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2002/07/owl#Ontology"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Lists the names of those tests that are deactivated for this
ontology.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="isCommentedOut">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#boolean"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
```

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        >This property can be used in the Protege-OWL UI to comment out
restrictions.  The Protege-OWL reasoning API does not send restrictions that have
this annotation to the reasoner.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="probeClass">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2002/07/owl#Class"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#boolean"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Specifies whether the class is marked as a probe class.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="readOnly">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#Property"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#boolean"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Specifies whether the annotated property is read-only in the Protege
UI.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="subclassesDisjoint">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2002/07/owl#Class"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#boolean"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Indicates whether all primitive subclasses of the annotated class shall be
made disjoint by default.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="todoPrefix">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2002/07/owl#Ontology"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >The prefix that is used to determine whether a property value is a
&quot;TODO&quot; item.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="todoProperty">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2002/07/owl#Ontology"/>
    <rdfs:range rdf:resource="http://www.w3.org/2002/07/owl#DatatypeProperty"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
```

```
        >A reference to the property that shall be used for TODO annotations. The
default value of this is owl:versionInfo.</rdfs:comment>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="usedLanguage">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
      <rdfs:domain rdf:resource="http://www.w3.org/2002/07/owl#Ontology"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Lists all languages that shall appear in the language selection
boxes.</rdfs:comment>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:about="http://www.owl-
ontologies.com/2005/08/07/xsp.owl#base">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
      <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Datatype"/>
      <rdfs:range rdf:resource="http://www.w3.org/2000/01/rdf-schema#Datatype"/>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Points to the base datatype of this (user-defined) datatype. This corresponds
to the xsd:base attribute in an xsd:restriction block.</rdfs:comment>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:about="http://www.owl-
ontologies.com/2005/08/07/xsp.owl#fractionDigits">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
      <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Datatype"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="http://www.owl-
ontologies.com/2005/08/07/xsp.owl#length">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
      <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Datatype"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="http://www.owl-
ontologies.com/2005/08/07/xsp.owl#maxExclusive">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
      <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Datatype"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="http://www.owl-
ontologies.com/2005/08/07/xsp.owl#maxInclusive">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Datatype"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="http://www.owl-
ontologies.com/2005/08/07/xsp.owl#maxLength">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Datatype"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="http://www.owl-
ontologies.com/2005/08/07/xsp.owl#minExclusive">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Datatype"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="http://www.owl-
ontologies.com/2005/08/07/xsp.owl#minInclusive">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Datatype"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="http://www.owl-
ontologies.com/2005/08/07/xsp.owl#minLength">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Datatype"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="http://www.owl-
ontologies.com/2005/08/07/xsp.owl#pattern">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
    <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Datatype"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:about="http://www.owl-
ontologies.com/2005/08/07/xsp.owl#totalDigits">
```

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      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#AnnotationProperty"/>
      <rdfs:domain rdf:resource="http://www.w3.org/2000/01/rdf-
schema#Datatype"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
   </owl:DatatypeProperty>
</rdf:RDF>
```

```
<?xml version="1.0"?>
<rdf:RDF xmlns="http://www.owl-ontologies.com/Ontology1160514425.owl#"
    xml:base="http://www.owl-ontologies.com/core.owl"
    xmlns:p1="http://protege.stanford.edu/plugins/owl/protege#"
    xmlns:OS="http://www.owl-ontologies.com/Ontology1156787408.owl#"
    xmlns:swrlbImport="http://www.daml.org/rules/proposal/swrlb.owl#"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema#"
    xmlns:BC="http://www.owl-ontologies.com/core.owl#"

xmlns:UP="http://wwwis.win.tue.nl/~chime/ontologies/usermodelingontology.owl#"
    xmlns:p2="http://protege.stanford.edu/plugins/owl/dc/protege-dc.owl#"
    xmlns:swrlb="http://www.w3.org/2003/11/swrlb#"
    xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
    xmlns:swrlImport="http://www.daml.org/rules/proposal/swrl.owl#"
    xmlns:foaf="http://xmlns.com/foaf/0.1/"
    xmlns:vs="http://www.w3.org/2003/06/sw-vocab-status/ns#"
```

```
 xmlns:owl="http://www.w3.org/2002/07/owl#"
 xmlns:dcterms="http://purl.org/dc/terms/"
 xmlns:xsp="http://www.owl-ontologies.com/2005/08/07/xsp.owl#"
 xmlns:dc="http://purl.org/dc/elements/1.1/"
 xmlns:swrl="http://www.w3.org/2003/11/swrl#"
 xmlns:BP="http://www.owl-ontologies.com/BP.owl#"
 xmlns:daml="http://www.daml.org/2001/03/daml+oil#"
 xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
 xmlns:PO="http://www.owl-ontologies.com/Ontology1156283607.owl#">
<owl:Ontology rdf:about="">
  <owl:imports rdf:resource="http://protege.stanford.edu/plugins/owl/protege"/>
  <owl:imports rdf:resource="http://www.daml.org/rules/proposal/swrl.owl"/>
  <owl:imports rdf:resource="http://www.daml.org/rules/proposal/swrlb.owl"/>
</owl:Ontology>
<swrl:Variable rdf:ID="x1"/>
<swrl:Variable rdf:ID="x2"/>
<swrl:Variable rdf:ID="x3"/>
<BC:Complex rdf:ID="Activity1">
  <BC:ActivityName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Product Promotions</BC:ActivityName>
</BC:Complex>
<owl:DatatypeProperty rdf:ID="ActivityName">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#EnterpriseActivity"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="ActivitySpecDescription">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#EnterpriseActivitySpecification"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="ActivitySpecificationName">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#EnterpriseActivitySpecification"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="assignedToPerson">
  <owl:inverseOf rdf:resource="#jobTitle"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="assignedToWorkgroup">
  <owl:inverseOf rdf:resource="#workgroupIncludesPerson"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="associatedWithBusinessArea">
  <rdfs:domain rdf:resource="#EnterpriseBusinessObjective"/>
  <rdfs:range rdf:resource="#EnterpriseBusinessArea"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="associatedWithBusinessRule">
    <owl:inverseOf rdf:resource="#roleReferencedByBusinessRule"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="authorofBusinessDocument">
    <owl:inverseOf rdf:resource="#businessDocumentAuthor"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="belongstoBusinessArea">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseStrategicSolutions"/>
    <rdfs:range rdf:resource="#EnterpriseBusinessArea"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="belongstoBusinessDomain">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessStakeholders"/>
    <rdfs:range rdf:resource="#EnterpriseBusinessDomain"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="belongstoBusinessStrategy">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessObjective"/>
    <rdfs:range rdf:resource="#EnterpriseBusinessStrategy"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="businesAreaReferencesDocument">
    <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="businesDomainReferencesDocument">
    <rdfs:domain rdf:resource="#EnterpriseBusinessDomain"/>
  </owl:ObjectProperty>
  <BC:EnterpriseBusinessArea rdf:ID="BusinessArea1">
    <BC:businessAreaName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">CRM</BC:businessAr
eaName>
    <BC:businessAreaDeletionTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
        >2006-09-04T00:00:00</BC:businessAreaDeletionTimestamp>
    <BC:memberOfBusinessDomainView rdf:resource="#BusinessDomain1"/>
    <BC:businessAreaStakeholder rdf:resource="#Manager"/>
    <BC:isamemberofBusinessDomain rdf:resource="#BusinessDomain1"/>
  </BC:EnterpriseBusinessArea>
  <BC:EnterpriseBusinessArea rdf:ID="BusinessArea2">
    <BC:businessAreaName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">SupplyChain</BC:busi
nessAreaName>
  </BC:EnterpriseBusinessArea>
  <BC:EnterpriseBusinessArea rdf:ID="BusinessArea3">
    <BC:businessAreaName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">eProcurement</BC:bu
sinessAreaName>
    <BC:isamemberofBusinessDomain rdf:resource="#BusinessDomain1"/>
  </BC:EnterpriseBusinessArea>
  <owl:ObjectProperty rdf:ID="businessAreaAsssociatedWithBusinessObjective">
    <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
    <owl:inverseOf
rdf:resource="#BusinessObjectiveassociatedwithBusinessArea"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="businessAreaBoundary">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessAreaCreationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessAreaDeletionTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessAreaDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessAreaModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessAreaName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessAreaScope">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
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<owl:ObjectProperty rdf:ID="businessAreaStakeholder">
  <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
  <owl:inverseOf rdf:resource="#stakeholderOfBusinessArea"/>
</owl:ObjectProperty>
<swrl:Imp rdf:ID="Rule-2">
  <swrl:head>
    <rdf:List>
      <rdf:first>
        <rdf:Description>
          <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
          <swrl:argument2 rdf:resource="#x3"/>
          <swrl:argument1 rdf:resource="#x2"/>
          <swrl:propertyPredicate rdf:resource="#belongstoBusinessDomain"/>
        </rdf:Description>
      </rdf:first>
      <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#nil"/>
    </rdf:List>
  </swrl:head>
  <swrl:body>
    <rdf:List>
      <rdf:first>
        <rdf:Description>
          <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
          <swrl:argument2 rdf:resource="#x2"/>
          <swrl:argument1 rdf:resource="#x1"/>
          <swrl:propertyPredicate rdf:resource="#businessAreaStakeholder"/>
        </rdf:Description>
      </rdf:first>
      <rdf:rest>
        <rdf:List>
          <rdf:first>
            <rdf:Description>
              <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
              <swrl:argument2 rdf:resource="#x3"/>
              <swrl:argument1 rdf:resource="#x1"/>
              <swrl:propertyPredicate
rdf:resource="#isamemberofBusinessDomain"/>
            </rdf:Description>
          </rdf:first>
          <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#nil"/>
        </rdf:List>
      </rdf:rest>
      </rdf:List>
    </swrl:body>
  </swrl:Imp>
  <owl:DatatypeProperty rdf:ID="businessContextDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessContext"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessContextMeaning">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessContextName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessContext"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="businessDoaminIncludesBusinessArea">
    <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessDomain"/>
    <rdfs:range rdf:resource="#EnterpriseBusinessArea"/>
    <owl:inverseOf rdf:resource="#isamemberofBusinessDomain"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="businessDocumentAuthor">
    <owl:inverseOf rdf:resource="#authorofBusinessDocument"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="businessDocumentDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessDocumentName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <BC:EnterpriseBusinessDomain rdf:ID="BusinessDomain1">
    <BC:businessDomainName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Technology</BC:busi
nessDomainName>
    <BC:industrySegment
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Technology and Solutions</BC:industrySegment>
    <BC:businessDoaminIncludesBusinessArea rdf:resource="#BusinessArea1"/>
    <BC:businessDoaminIncludesBusinessArea rdf:resource="#BusinessArea3"/>
  </BC:EnterpriseBusinessDomain>
  <owl:DatatypeProperty rdf:ID="businessDomainCreationTimestamp">
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    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessDomain"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessDomainDeletionTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessDomain"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessDomainDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessDomain"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessDomainModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessDomain"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessDomainName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessDomain"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="businessDomainStakeholder">
    <rdfs:domain rdf:resource="#EnterpriseBusinessDomain"/>
    <owl:inverseOf rdf:resource="#stakeholderOfBusinessDomain"/>
  </owl:ObjectProperty>
  <BC:EnterpriseBusinessGoal rdf:ID="BusinessGoal1">
    <BC:businessGoalCreationTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
      >2006-07-04T00:00:00</BC:businessGoalCreationTimestamp>
    <BC:businessGoalDeletionTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
      >2006-09-04T00:00:00</BC:businessGoalDeletionTimestamp>
    <BC:businessGoalName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Increase Contracts</BC:businessGoalName>
    <BC:businessGoalDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Increase the number of contratcs in specialist areas.Facilitate Sales force to
find best oppurtunities in specialist area through better focusing on potential
clients.Improve identification of suitable clients.Obtain development contratcs
through better access to suitable clients.</BC:businessGoalDescription>
  </BC:EnterpriseBusinessGoal>
  <BC:EnterpriseBusinessGoal rdf:ID="BusinessGoal2">
```

```
      <BC:businessGoalCreationTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
        >2006-10-04T00:00:00</BC:businessGoalCreationTimestamp>
      <BC:businessGoalModificationTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
        >2006-11-03T00:00:00</BC:businessGoalModificationTimestamp>
      <BC:businessGoalDeletionTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
        >2007-09-04T00:00:00</BC:businessGoalDeletionTimestamp>
      <BC:businessGoalName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Improve solutions quality</BC:businessGoalName>
      <BC:businessGoalDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Improve quality of solutions to client needs.Assist the managers to locate
,assemble and support consultant teams to produce high quality solutions in minimun
time.Help clients get access to advice provided by consultants and to precisely state
their requirmenets.Also montior the progress of
work.</BC:businessGoalDescription>
    </BC:EnterpriseBusinessGoal>
    <BC:EnterpriseBusinessGoal rdf:ID="BusinessGoal3">
      <BC:businessGoalCreationTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
        >2006-09-04T00:00:00</BC:businessGoalCreationTimestamp>
      <BC:businessGoalModificationTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
        >2006-09-04T00:00:00</BC:businessGoalModificationTimestamp>
      <BC:businessGoalDeletionTimestamp
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime"
        >2007-09-04T00:00:00</BC:businessGoalDeletionTimestamp>
      <BC:businessGoalName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Develop/Maintain Skills and Resources.</BC:businessGoalName>
      <BC:businessGoalDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >To develop and maintain skills and  resources in  specialist area.Assist
managers to ensure that consultants and managers are aware of latest technical
developments.Improve access to neccessary training
facilities.</BC:businessGoalDescription>
    </BC:EnterpriseBusinessGoal>
    <owl:DatatypeProperty rdf:ID="businessGoalCreationTimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseBusinessGoal"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="businessGoalDeletionTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessGoal"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessGoalDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessGoal"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessGoalModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessGoal"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessGoalName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessGoal"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="businessObjective">
    <rdfs:domain rdf:resource="#EnterpriseBusinessGoal"/>
    <owl:inverseOf rdf:resource="#inverse_of_businessObjective"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="BusinessObjectiveassociatedwithBusinessArea">
    <rdfs:range rdf:resource="#EnterpriseBusinessArea"/>
    <owl:inverseOf
rdf:resource="#businessAreaAsssociatedWithBusinessObjective"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="businessObjectiveCreationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessObjective"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessObjectiveDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessObjective"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessObjectiveName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessObjective"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <BC:EnterpriseBusinessPerformance rdf:ID="BusinessPerformance2006">
```

```
      <BC:NetWorth-IntangibleAssests
rdf:datatype="http://www.w3.org/2001/XMLSchema#float">940.0</BC:NetWorth-
IntangibleAssests>
      <BC:DividendPercentage
rdf:datatype="http://www.w3.org/2001/XMLSchema#float">0.0</BC:DividendPerce
ntage>
      <BC:FixedAssests
rdf:datatype="http://www.w3.org/2001/XMLSchema#float">542.0</BC:FixedAssest
s>
      <BC:EPSinDollars
rdf:datatype="http://www.w3.org/2001/XMLSchema#float">13.99</BC:EPSinDollar
s>
      <BC:TotalRevenue
rdf:datatype="http://www.w3.org/2001/XMLSchema#float">4169.0</BC:TotalReve
nue>
      <BC:PerformanceYear
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2006</BC:PerformanceY
ear>
      <BC:Earnings
rdf:datatype="http://www.w3.org/2001/XMLSchema#float">274.0</BC:Earnings>
    </BC:EnterpriseBusinessPerformance>
    <owl:DatatypeProperty rdf:ID="BusinessPlanDescription">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseBusinessPlan"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="BusinessPlanName">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseBusinessPlan"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <BC:EnterpriseBusinessPolicies rdf:ID="BusinessPolicy1">
      <BC:BusinessPolicyType
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Environmental</BC:B
usinessPolicyType>
      <BC:BusinessPolicyName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">EHS-
1</BC:BusinessPolicyName>
      <BC:BusinessPolicyDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Our Environment, Health and Safety Department (EHS) makes every effort
to ensure the safety of our customers, our employees and our environment. These
efforts are the responsibility of each employee in the way that they work
everyday</BC:BusinessPolicyDescription>
    </BC:EnterpriseBusinessPolicies>
    <owl:DatatypeProperty rdf:ID="BusinessPolicyDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessPolicies"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="BusinessPolicyName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessPolicies"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="BusinessPolicyType">
    <rdfs:domain rdf:resource="#EnterpriseBusinessPolicies"/>
    <rdfs:range>
      <owl:DataRange>
        <owl:oneOf>
          <rdf:List>
            <rdf:first
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Environmental</rdf:fir
st>
            <rdf:rest>
              <rdf:List>
                <rdf:first
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Safety</rdf:first>
                <rdf:rest>
                  <rdf:List>
                    <rdf:first
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Integrity</rdf:first>
                    <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdf-
syntax-ns#nil"/>
                  </rdf:List>
                </rdf:rest>
              </rdf:List>
            </rdf:rest>
          </rdf:List>
        </owl:oneOf>
      </owl:DataRange>
    </rdfs:range>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="BusinessProcessContext">
    <rdfs:subClassOf rdf:resource="#EnterpriseBusinessContext"/>
    <owl:disjointWith rdf:resource="#ProductClassificationContext"/>
    <owl:disjointWith rdf:resource="#GeopoliticalContext"/>
    <owl:disjointWith rdf:resource="#SystemCapabilitiesContext"/>
    <owl:disjointWith rdf:resource="#IndustryClassificationContext"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
```

```
        >This is the classification of the Business Process. It is the primary Context
Category, and provides many useful distinctions in the analysis of Core
Components.</rdfs:comment>
  </owl:Class>
  <owl:ObjectProperty rdf:ID="businessProcessContext"/>
  <owl:DatatypeProperty rdf:ID="businessProcessCreationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessProcessDeletionTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessProcessDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessProcessModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessProcessName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="businessProcessRoleContext"/>
  <owl:ObjectProperty rdf:ID="businessRuleContext"/>
  <owl:DatatypeProperty rdf:ID="businessRuleCreationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessRuleDeletionTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessRuleDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessRuleModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="businessRuleName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <BC:EnterpriseBusinessStrategy rdf:ID="BusinessStrategy1">
    <BC:BusinessStrategyName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >ImproveCustomerSatisfaction</BC:BusinessStrategyName>
    <BC:hasPlan rdf:resource="#Short-Term-Plan1"/>
    <BC:hasObjective rdf:resource="#ServiceCustomization"/>
  </BC:EnterpriseBusinessStrategy>
  <owl:DatatypeProperty rdf:ID="BusinessStrategyName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessStrategy"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <BC:EnterpriseBusinessValues rdf:ID="BusinessValue1">
    <BC:BusinessValueName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Integrity</BC:Busines
sValueName>
    <BC:BusinessValueDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >We behave ethically.  We tell the truth.  We keep our commitments. We
meet both the spirit and letter of the law.</BC:BusinessValueDescription>
  </BC:EnterpriseBusinessValues>
  <BC:EnterpriseBusinessValues rdf:ID="BusinessValue2">
    <BC:BusinessValueName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Accountability</BC:B
usinessValueName>
    <BC:BusinessValueDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >We take responsibility for our actions.  We live our values.  We set clear
goals, measure results, and seek to improve.  We build and protect the Duke Energy
brand and reputation.</BC:BusinessValueDescription>
  </BC:EnterpriseBusinessValues>
  <BC:EnterpriseBusinessValues rdf:ID="BusinessValue3">
    <BC:BusinessValueName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Teamwork</BC:Busin
essValueName>
    <BC:BusinessValueDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >We work together to achieve superior results.  We share ideas and talents to
develop solutions.  We support and rely on each other.  We value clear and open
communications.</BC:BusinessValueDescription>
  </BC:EnterpriseBusinessValues>
  <owl:DatatypeProperty rdf:ID="BusinessValueDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessValues"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="BusinessValueName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessValues"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <BC:EnterpriseBusinessValues rdf:ID="BusinessValues4">
    <BC:BusinessValueName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Initiative</BC:Busines
sValueName>
    <BC:BusinessValueDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >We lead the way.  We have the courage and creativity to shape the future.
We have the discipline to manage risks.  We act with speed and
decisiveness.</BC:BusinessValueDescription>
  </BC:EnterpriseBusinessValues>
  <BC:EnterpriseBusinessValues rdf:ID="BusinessValues5">
    <BC:BusinessValueName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Stewardship</BC:Busi
nessValueName>
    <BC:BusinessValueDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >We care about people and the world in which we live.  We operate safely.
We are environmentally responsible.  We strengthen our
communities.</BC:BusinessValueDescription>
  </BC:EnterpriseBusinessValues>
  <BC:BusinessProcessContext rdf:ID="CatalogManagementProcess">
    <BC:businessContextName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >CatalogManagementProcess</BC:businessContextName>
    <BC:businessContextDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >It refers to all the activities and details related to this
process.</BC:businessContextDescription>
    <BC:businessContextMeaning
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >It refers to all the activities and details related to this
process.</BC:businessContextMeaning>
  </BC:BusinessProcessContext>
  <owl:Class rdf:ID="City">
    <rdfs:subClassOf rdf:resource="#EnterpriseLocation"/>
  </owl:Class>
  <BC:City rdf:ID="City1">
    <BC:locationDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Corporate Headquarters</BC:locationDescription>
      <BC:nameofCity
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">SanFrancisco</BC:na
meofCity>
    </BC:City>
    <BC:City rdf:ID="City2">
      <BC:locationDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >Offshore Office Location</BC:locationDescription>
      <BC:nameofCity
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Pune.</BC:nameofCit
y>
    </BC:City>
    <BC:EnterpriseBusinessStakeholders rdf:ID="Client01">
      <BC:StakeHolderGoal
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >Purchase Products</BC:StakeHolderGoal>
      <BC:StakeHolderGoalDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >To purchase speciic products from the
organisation.</BC:StakeHolderGoalDescription>
    </BC:EnterpriseBusinessStakeholders>
    <owl:Class rdf:ID="CommercialGoals">
      <rdfs:subClassOf rdf:resource="#EnterpriseBusinessGoal"/>
    </owl:Class>
    <owl:Class rdf:ID="Complex">
      <rdfs:subClassOf rdf:resource="#EnterpriseActivity"/>
    </owl:Class>
    <owl:ObjectProperty rdf:ID="consistsOfActivity">
      <rdfs:range rdf:resource="#EnterpriseActivity"/>
    </owl:ObjectProperty>
    <BC:EnterpriseBusinessStakeholders rdf:ID="Consultant">
      <BC:StakeholderConcern
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >Reduce the cost of inputs</BC:StakeholderConcern>
      <BC:StakeHolderGoal
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >Provide Solution</BC:StakeHolderGoal>
      <BC:StakeHolderGoalDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >To Identify client needs and provide
solutions.</BC:StakeHolderGoalDescription>
      <BC:hasSolution rdf:resource="#StrategicSolutions3"/>
    </BC:EnterpriseBusinessStakeholders>
    <owl:ObjectProperty rdf:ID="consumesResource">
      <rdfs:domain rdf:resource="#EnterpriseActivity"/>
      <owl:inverseOf rdf:resource="#isUsedByActivity"/>
```

```
  </owl:ObjectProperty>
  <owl:Class rdf:ID="Country">
    <rdfs:subClassOf rdf:resource="#EnterpriseLocation"/>
  </owl:Class>
  <BC:Country rdf:ID="Country1">
    <BC:locationDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Corporate Headquarters</BC:locationDescription>
    <BC:nameofCountry
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">USA</BC:nameofCou
ntry>
  </BC:Country>
  <BC:Country rdf:ID="Country2">
    <BC:locationDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Offshore Office Location</BC:locationDescription>
    <BC:nameofCountry
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">India</BC:nameofCou
ntry>
  </BC:Country>
  <BC:Long-Term rdf:ID="CrossSelling">
    <BC:PotentialTechnology
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Data Mining.Building Client History.Mailing Services.Matching software of
Client profile to client profile.</BC:PotentialTechnology>
    <BC:KnowledgeRequiremnts
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Client Profiles.Strategies for providing new
services.</BC:KnowledgeRequiremnts>
    <BC:TypeOfBenefits
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Increasing business with exsisting clients.</BC:TypeOfBenefits>
  </BC:Long-Term>
  <owl:ObjectProperty rdf:ID="definedbyRole">
    <rdfs:domain rdf:resource="#EnterpriseBusinessStrategy"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="defines"/>
  <owl:DatatypeProperty rdf:ID="deonticAssignmentRuleName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="derivationRuleName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <BC:Long-Term rdf:ID="DirectMarketing">
```

```
      <BC:PotentialTechnology
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Email distribution and mailing services</BC:PotentialTechnology>
      <BC:KnowledgeRequiremnts
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Client
Profiles</BC:KnowledgeRequiremnts>
      <BC:TypeOfBenefits
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Acquiring new clients using Internet Technologies.Reduced cost of
marketing.</BC:TypeOfBenefits>
    </BC:Long-Term>
    <owl:DatatypeProperty rdf:ID="DividendPercentage">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseBusinessPerformance"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#float"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="Duration">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseActivity"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#time"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="Earnings">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseBusinessPerformance"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#float"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="employeePersonelID">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:Class rdf:ID="EnterpriseActivity">
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >This is intended to capture the notion of anything that involves doing, in
particular including action. The concept of Activity is closely linked with the idea of
the Doer, which may be a Person, Organisational-Unit or Machine.</rdfs:comment>

    </owl:Class>
    <owl:DatatypeProperty rdf:ID="EnterpriseActivitySpecCreationTimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseActivitySpecification"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="EnterpriseActivitySpecDeletionTimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseActivitySpecification"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
```

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  </owl:DatatypeProperty>
  <owl:Class rdf:ID="EnterpriseActivitySpecification">
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >There is a need to refer explicitly to specifications or plans for Enterprise
Activities. This is provided by the term Activity-Specification. An Activity-
Specification  specifies at some level of detail one or more possible Activities. If the
Activity-Spec has an Intended-Purpose, it is called a Plan.</rdfs:comment>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="EnterpriseActivitySpecModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseActivitySpecification"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="EnterpriseBusinessArea">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#businessAreaName"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <rdfs:subClassOf rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#memberOfBusinessDomainView"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
    </rdfs:subClassOf>
    <owl:disjointWith rdf:resource="#EnterpriseBusinessObjective"/>
    <owl:disjointWith rdf:resource="#EnterpriseBusinessDomain"/>
    <owl:disjointWith rdf:resource="#EnterpriseBusinessGoal"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >A business area is a collection of business process areas, which is a
collection of business processes.

The business area can be defined by the stakeholders that have direct or immediate
indirect influence on the business domain.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="EnterpriseBusinessContext">
    <rdfs:subClassOf>
      <owl:Restriction>
        <owl:onProperty rdf:resource="#businessContextName"/>
        <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
      </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >The formal description of a specific business circumstance as identified by
the values of a set of Context Categories, allowing different business circumstances to
be uniquely distinguished.

A unique and meaningful combination of Context values constitutes a business
context.</rdfs:comment>
    </owl:Class>
    <owl:Class rdf:ID="EnterpriseBusinessDomain">
      <rdfs:subClassOf rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#industrySegment"/>
          <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#businessDomainName"/>
          <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <owl:disjointWith rdf:resource="#EnterpriseBusinessGoal"/>
      <owl:disjointWith rdf:resource="#EnterpriseBusinessArea"/>
      <owl:disjointWith rdf:resource="#EnterpriseBusinessObjective"/>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >An Enterprise Business Domain helps us  understanding business area sub-
process interrelationships.</rdfs:comment>
    </owl:Class>
    <owl:Class rdf:ID="EnterpriseBusinessGoal">
      <rdfs:subClassOf rdf:resource="http://www.w3.org/2002/07/owl#Thing"/>
      <rdfs:subClassOf>
        <owl:Restriction>
          <owl:onProperty rdf:resource="#businessGoalName"/>
          <owl:cardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</owl:cardinality>
        </owl:Restriction>
      </rdfs:subClassOf>
      <owl:disjointWith rdf:resource="#EnterpriseBusinessArea"/>
      <owl:disjointWith rdf:resource="#EnterpriseBusinessDomain"/>
      <owl:disjointWith rdf:resource="#EnterpriseBusinessObjective"/>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
```

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        >A business goal represents a high-level requirement. It is a written statement
that describes a very broad, often somewhat abstract condition that is expected to be
achieved by the organization.

Business goals can be arranged in a goal hierarchy.
It is the statement of Business Intent.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="EnterpriseBusinessObjective">
    <owl:disjointWith rdf:resource="#EnterpriseBusinessGoal"/>
    <owl:disjointWith rdf:resource="#EnterpriseBusinessArea"/>
    <owl:disjointWith rdf:resource="#EnterpriseBusinessDomain"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >A business Objective is something the business is aiming towards or a
strategic position it is aiming to achieve.It is usually a step in the strategy.Objectives
are similar to goals but often have success or failure rather than quantifiable
metrics.A carefully written statement that grows out of the business goal describing a
pattern of behavior and/or activities that a business must follow to successfully meet a
stated goal.

Objectives are the basic building blocks of strategy. Implementing a business strategy
is accomplished by translating the vision and strategy into a set of operational
objectives that drive behavior and performance.</rdfs:comment>
  </owl:Class>
  <BC:EnterpriseBusinessObjective rdf:ID="EnterpriseBusinessObjective1">
    <BC:meetsBusinessGoal rdf:resource="#BusinessGoal1"/>
  </BC:EnterpriseBusinessObjective>
  <owl:Class rdf:ID="EnterpriseBusinessPerformance"/>
  <owl:Class rdf:ID="EnterpriseBusinessPlan"/>
  <owl:Class rdf:ID="EnterpriseBusinessPolicies"/>
  <owl:Class rdf:ID="EnterpriseBusinessStakeholders">
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Business Stakeholders are groups of people or individuals who ahve an
interest( a stake) in the performance of a Business or Organisation.For example:
Customers,Consumers,Suppliers,Owners,Managers,Govt,Community.</rdfs:commen
t>
  </owl:Class>
  <owl:Class rdf:ID="EnterpriseBusinessStrategy">
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Company&apos;s Business Strategy is located in the
environmental,social,economical context.It signals the strategic direction a business
adopts,the values it upholds,the medium and long term objectives and its business
plan for short term.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="EnterpriseBusinessValues">
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
```

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        >By values, we mean the qualitative goals which the company strives to
achieve in all its activities.A value is a belief, a mission, or a philosophy that is really
meaningful to the company. An example of a business value is: &quot;Customer
Satisfaction.&quot; Another example of a value is &quot;Being Ethical and
Truthful.&quot; Every company has one or more values, whether they are
consciously aware of it or not. Another way of saying it is that a value is a statement
of the company&apos;s intention and commitment to achieve a high level of
performance on a specific QUALITATIVE factor.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="EnterpriseLocation">
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Describes the geological/physical  location of the
Enterprise.</rdfs:comment>
  </owl:Class>
  <owl:Class rdf:ID="EnterpriseStrategicSolutions"/>
  <owl:DatatypeProperty rdf:ID="EPSinDollars">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessPerformance"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#float"/>
  </owl:DatatypeProperty>
  <BC:Short-Term rdf:ID="Event_Identification">
    <BC:PotentialTechnology
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Message analysis</BC:PotentialTechnology>
    <BC:KnowledgeRequiremnts
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Identifying unusal events</BC:KnowledgeRequiremnts>
    <BC:TypeOfBenefits
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Increase relationship with client by suggesting services to meet client
circumstances.</BC:TypeOfBenefits>
  </BC:Short-Term>
  <owl:Class rdf:ID="ExecutedSpecification">
    <rdfs:subClassOf rdf:resource="#EnterpriseActivitySpecification"/>
  </owl:Class>
  <owl:ObjectProperty rdf:ID="executesActivitySpecification">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="#EnterpriseActivitySpecification"/>
  </owl:ObjectProperty>
  <owl:Class rdf:ID="FinancialGoals">
    <rdfs:subClassOf rdf:resource="#EnterpriseBusinessGoal"/>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="firstName">
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="FixedAssests">
```

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    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessPerformance"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#float"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="gender">
    <rdfs:range>
      <owl:DataRange>
        <owl:oneOf>
          <rdf:List>
            <rdf:first
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Male</rdf:first>
            <rdf:rest>
              <rdf:List>
                <rdf:first
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Female</rdf:first>
                <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdf-
syntax-ns#nil"/>
              </rdf:List>
            </rdf:rest>
          </rdf:List>
        </owl:oneOf>
      </owl:DataRange>
    </rdfs:range>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="GeopoliticalContext">
    <rdfs:subClassOf rdf:resource="#EnterpriseBusinessContext"/>
    <owl:disjointWith rdf:resource="#BusinessProcessContext"/>
    <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
      >Specifies the semantic and structural variation. This is often the result of
regional or cultural factors.</rdfs:comment>
  </owl:Class>
  <owl:ObjectProperty rdf:ID="geopoliticalContext"/>
  <owl:ObjectProperty rdf:ID="hascorrespondingActivity">
    <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
    <rdfs:domain rdf:resource="#ExecutedSpecification"/>
    <owl:inverseOf rdf:resource="#inverse_of_hascorrespondingActivity"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasdescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessPlan"/>
    <rdfs:range rdf:resource="#EnterpriseActivitySpecification"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasGender">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="hasObjective">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessStrategy"/>
    <rdfs:range rdf:resource="#EnterpriseBusinessObjective"/>
  </owl:ObjectProperty>
  <swrl:Imp rdf:ID="Rule-1">
    <swrl:head>
      <rdf:List>
        <rdf:first>
          <rdf:Description>
            <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
            <swrl:argument2 rdf:resource="#x3"/>
            <swrl:argument1 rdf:resource="#x1"/>
            <swrl:propertyPredicate rdf:resource="#meetsbusinessgoal"/>
          </rdf:Description>
        </rdf:first>
        <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-ns#nil"/>
      </rdf:List>
    </swrl:head>
    <swrl:body>
      <rdf:List>
        <rdf:first>
          <rdf:Description>
            <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
            <swrl:argument2 rdf:resource="#x2"/>
            <swrl:argument1 rdf:resource="#x1"/>
            <swrl:propertyPredicate rdf:resource="#hasObjective"/>
          </rdf:Description>
        </rdf:first>
        <rdf:rest>
          <rdf:List>
            <rdf:first>
              <rdf:Description>
                <rdf:type
rdf:resource="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
                <swrl:argument2 rdf:resource="#x3"/>
                <swrl:argument1 rdf:resource="#x2"/>
                <swrl:propertyPredicate rdf:resource="#meetsBusinessGoal"/>
              </rdf:Description>
            </rdf:first>
            <rdf:rest rdf:resource="http://www.w3.org/1999/02/22-rdf-syntax-
ns#nil"/>
          </rdf:List>
        </rdf:rest>
        </rdf:List>
      </swrl:body>
    </swrl:Imp>
    <owl:ObjectProperty rdf:ID="hasOuputs">
      <rdfs:domain rdf:resource="#EnterpriseActivity"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="hasPlan">
      <rdfs:domain rdf:resource="#EnterpriseBusinessStrategy"/>
      <rdfs:range rdf:resource="#EnterpriseBusinessPlan"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="hasSolution">
      <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseBusinessStakeholders"/>
      <rdfs:range rdf:resource="#EnterpriseStrategicSolutions"/>
      <owl:inverseOf rdf:resource="#providesSolutionto"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="hasSpecification">
      <rdfs:domain rdf:resource="#EnterpriseActivity"/>
      <rdfs:range rdf:resource="#EnterpriseActivitySpecification"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="hasSubAcitivities">
      <rdfs:domain rdf:resource="#Complex"/>
      <rdfs:range rdf:resource="#Sub-Activity"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="holdsauthority">
      <rdfs:range rdf:resource="#EnterpriseActivity"/>
    </owl:ObjectProperty>
    <BC:Short-Term rdf:ID="Improved_field_service">
      <BC:PotentialTechnology
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Personalised client interface.</BC:PotentialTechnology>
      <BC:KnowledgeRequiremnts
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Current Status of client service.Potential new directions,given the client
profile.</BC:KnowledgeRequiremnts>
      <BC:TypeOfBenefits
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Reduced cost of travel.Client retention through better
service.</BC:TypeOfBenefits>
    </BC:Short-Term>
    <BC:Short-Term rdf:ID="Improved_Response_to_Client_Requests">
      <BC:PotentialTechnology
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Contact center.Personalised client workspace.Web based call
center</BC:PotentialTechnology>
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      <BC:KnowledgeRequiremnts
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
         >Building Inquiry profiles.Standard responses to
queries</BC:KnowledgeRequiremnts>
      <BC:TypeOfBenefits
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
         >Reduced cost of responding to clients.Client retention through better
service.</BC:TypeOfBenefits>
    </BC:Short-Term>
    <owl:ObjectProperty rdf:ID="includesBusinessProcessArea">
      <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
      <owl:inverseOf rdf:resource="#memberOfenterpriseBusinessArea"/>
    </owl:ObjectProperty>
    <owl:Class rdf:ID="IndustryClassificationContext">
      <rdfs:subClassOf rdf:resource="#EnterpriseBusinessContext"/>
      <owl:disjointWith rdf:resource="#BusinessProcessContext"/>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
         >Traditionally, business vocabularies are divided into industry verticals. This
Context Category specifies a particular industry
type and segment.</rdfs:comment>
    </owl:Class>
    <owl:ObjectProperty rdf:ID="industryContext"/>
    <owl:DatatypeProperty rdf:ID="industrySegment">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseBusinessDomain"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="integrityRuleName">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="inverse_of_businessObjective">
      <rdfs:range rdf:resource="#EnterpriseBusinessGoal"/>
      <owl:inverseOf rdf:resource="#businessObjective"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="inverse_of_hascorrespondingActivity">
      <rdfs:range rdf:resource="#ExecutedSpecification"/>
      <owl:inverseOf rdf:resource="#hascorrespondingActivity"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="isActivityOwner">
      <rdfs:range rdf:resource="#EnterpriseActivity"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="isamemberofBusinessDomain">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
      <rdfs:range rdf:resource="#EnterpriseBusinessDomain"/>
    <owl:inverseOf rdf:resource="#businessDoaminIncludesBusinessArea"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="isDoerofActivity">
    <rdfs:range rdf:resource="#EnterpriseActivity"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="isLinkedtoTimeInterval">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="isperformedbyOrganisationUnit">
    <rdfs:domain rdf:resource="#EnterpriseActivity"/>
    <owl:inverseOf rdf:resource="#performsactivity"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="isperformedbyRole">
    <rdfs:domain rdf:resource="#EnterpriseActivity"/>
    <owl:inverseOf rdf:resource="#performsActivity"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="isresponsiblefor">
    <rdfs:range rdf:resource="#EnterpriseBusinessStrategy"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="isUsedByActivity">
    <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
    <rdfs:range rdf:resource="#EnterpriseActivity"/>
    <owl:inverseOf rdf:resource="#consumesResource"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="jobTitle">
    <owl:inverseOf rdf:resource="#assignedToPerson"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="jobTitleCreationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="jobTitleDeletionTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="jobTitleDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="jobTitleModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="jobTitleName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="KnowledgeRequiremnts">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessObjective"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="lastName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="locationDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseLocation"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="Long-Term">
    <rdfs:subClassOf rdf:resource="#EnterpriseBusinessObjective"/>
  </owl:Class>
  <owl:Class rdf:ID="Long-Term-Plan">
    <rdfs:subClassOf rdf:resource="#EnterpriseBusinessPlan"/>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="maintenanceRelease">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="majorRelease">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <BC:EnterpriseBusinessStakeholders rdf:ID="Manager">
    <BC:StakeHolderName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Tedd</BC:StakeHolde
rName>
    <BC:StakeholderConcern
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Reduce the cost of transfers between suppliers</BC:StakeholderConcern>
    <BC:StakeHolderGoal
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Address Client Problem.</BC:StakeHolderGoal>
    <BC:StakeHolderGoalDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >To organise the solutions team to address the client
problem.</BC:StakeHolderGoalDescription>
    <BC:stakeholderOfBusinessArea rdf:resource="#BusinessArea1"/>
    <BC:hasSolution rdf:resource="#StrategicSolutions2"/>
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</BC:EnterpriseBusinessStakeholders>
<owl:ObjectProperty rdf:ID="managesOrganizationUnit">
  <owl:inverseOf rdf:resource="#organizationUnitManager"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="meetsBusinessGoal">
  <rdfs:domain rdf:resource="#EnterpriseBusinessObjective"/>
  <rdfs:range rdf:resource="#EnterpriseBusinessGoal"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="meetsbusinessgoal">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#EnterpriseBusinessStrategy"/>
  <rdfs:range rdf:resource="#EnterpriseBusinessGoal"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="meetsObjective">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#EnterpriseStrategicSolutions"/>
  <rdfs:range rdf:resource="#EnterpriseBusinessObjective"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="memberOfBusinessDomainView">
  <rdfs:domain rdf:resource="#EnterpriseBusinessArea"/>
  <rdfs:range rdf:resource="#EnterpriseBusinessDomain"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="memberOfenterpriseBusinessArea">
  <rdfs:range rdf:resource="#EnterpriseBusinessArea"/>
  <owl:inverseOf rdf:resource="#includesBusinessProcessArea"/>
</owl:ObjectProperty>
<owl:DatatypeProperty rdf:ID="middleInitial">
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="minorRelease">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="nameofCity">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#City"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="nameofCountry">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#Country"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="nameofState">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:domain rdf:resource="#Region"/>
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    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="needstoachieve">
    <rdfs:domain rdf:resource="#EnterpriseBusinessStrategy"/>
    <rdfs:range rdf:resource="#EnterpriseBusinessGoal"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="NetWorth-IntangibleAssests">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessPerformance"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#float"/>
  </owl:DatatypeProperty>
  <owl:Class rdf:ID="NonExecutedSpecification">
    <rdfs:subClassOf rdf:resource="#EnterpriseActivitySpecification"/>
  </owl:Class>
  <BC:NonExecutedSpecification rdf:ID="NonExecutedSpecification1">
    <BC:ActivitySpecificationName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
       >ProductPromo1-Doc1</BC:ActivitySpecificationName>
    <BC:ActivitySpecDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
       >Describes the Business Paln for product promotion and
marketing.</BC:ActivitySpecDescription>
  </BC:NonExecutedSpecification>
  <owl:ObjectProperty rdf:ID="ObjectProperty_14"/>
  <owl:ObjectProperty rdf:ID="ObjectProperty_15"/>
  <owl:ObjectProperty rdf:ID="ObjectProperty_23"/>
  <owl:ObjectProperty rdf:ID="ObjectProperty_24"/>
  <owl:ObjectProperty rdf:ID="ObjectProperty_26"/>
  <owl:ObjectProperty rdf:ID="ObjectProperty_3"/>
  <owl:ObjectProperty rdf:ID="ObjectProperty_4"/>
  <owl:ObjectProperty rdf:ID="ObjectProperty_54"/>
  <owl:ObjectProperty rdf:ID="organizationChart">
    <owl:inverseOf rdf:resource="#referencesOrganization"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="organizationChartCreationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="organizationChartDeletionTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="organizationChartDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
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<owl:DatatypeProperty rdf:ID="organizationChartModificationTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="organizationChartName">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="organizationCreationTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="organizationDeletionTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="organizationDescription">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="organizationModificationTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="organizationName">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="organizationUnitCreationTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="organizationUnitDeletionTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="organizationUnitManager">
  <owl:inverseOf rdf:resource="#managesOrganizationUnit"/>
</owl:ObjectProperty>
<owl:DatatypeProperty rdf:ID="organizationUnitModificationTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="organizationUnitName">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="organizationUnitPerformsTask">
    <owl:inverseOf rdf:resource="#performedByOrganizationUnit"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="PerformanceYear">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessPerformance"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#int"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="performedByOrganizationUnit">
    <owl:inverseOf rdf:resource="#organizationUnitPerformsTask"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="performedByRole"/>
  <owl:ObjectProperty rdf:ID="performsActivity">
    <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
    <rdfs:range rdf:resource="#EnterpriseActivity"/>
    <owl:inverseOf rdf:resource="#isperformedbyRole"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="performsactivity">
    <rdfs:range rdf:resource="#EnterpriseActivity"/>
    <owl:inverseOf rdf:resource="#isperformedbyOrganisationUnit"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="personCreationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="personDeletionTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="personDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="personModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="PossibleDirectionForConcerns"/>
  <owl:Class rdf:ID="PostalCode">
    <rdfs:subClassOf rdf:resource="#EnterpriseLocation"/>
  </owl:Class>
  <owl:DatatypeProperty rdf:ID="postalcode">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#PostalCode"/>
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      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <BC:PostalCode rdf:ID="PostalCode1">
      <BC:locationDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >Corporate Headquarters</BC:locationDescription>
      <BC:postalcode
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">78890</BC:postalcode
>
    </BC:PostalCode>
    <BC:PostalCode rdf:ID="PostalCode2">
      <BC:locationDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >Offshore Office Location</BC:locationDescription>
      <BC:postalcode
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">211021</BC:postalcod
e>
    </BC:PostalCode>
    <owl:DatatypeProperty rdf:ID="PotentialTechnology">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseBusinessObjective"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:Class rdf:ID="ProductClassificationContext">
      <rdfs:subClassOf rdf:resource="#EnterpriseBusinessContext"/>
      <owl:disjointWith rdf:resource="#BusinessProcessContext"/>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >There are many types of information that are specific to products or services
being traded or referred to in a Business.</rdfs:comment>
    </owl:Class>
    <owl:ObjectProperty rdf:ID="productContext"/>
    <owl:ObjectProperty rdf:ID="providesSolutionto">
      <rdfs:domain rdf:resource="#EnterpriseStrategicSolutions"/>
      <rdfs:range rdf:resource="#EnterpriseBusinessStakeholders"/>
      <owl:inverseOf rdf:resource="#hasSolution"/>
    </owl:ObjectProperty>
    <owl:DatatypeProperty rdf:ID="reactionRuleName">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="refer"/>
    <owl:ObjectProperty rdf:ID="referencedByRole">
      <owl:inverseOf rdf:resource="#roleReferencesPrivilege"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="referencesOrganization">
      <owl:inverseOf rdf:resource="#organizationChart"/>
```

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  </owl:ObjectProperty>
  <owl:Class rdf:ID="Region">
    <rdfs:subClassOf rdf:resource="#EnterpriseLocation"/>
  </owl:Class>
  <BC:Region rdf:ID="Region1">
    <BC:nameofState
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">California</BC:nameo
fState>
    <BC:locationDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Corporate Headquarters</BC:locationDescription>
  </BC:Region>
  <BC:Region rdf:ID="Region2">
    <BC:nameofState
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Maharashtra.</BC:na
meofState>
    <BC:locationDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Offshore Office Location</BC:locationDescription>
  </BC:Region>
  <owl:ObjectProperty rdf:ID="relatedToBusinessProcess">
    <rdfs:domain rdf:resource="#EnterpriseBusinessObjective"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="relatedtoOrgUnit">
    <rdfs:domain rdf:resource="#EnterpriseBusinessObjective"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="resourceCreationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="resourceDeletionTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="resourceDescription">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="resourceModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="resourceName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
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<owl:DatatypeProperty rdf:ID="roleCreationTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="roleDeletionTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="roleModificationTimestamp">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="roleName">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:ID="rolename">
  <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
  <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
</owl:DatatypeProperty>
<owl:ObjectProperty rdf:ID="rolePerformsTask"/>
<owl:ObjectProperty rdf:ID="roleReferencedByBusinessRule">
  <owl:inverseOf rdf:resource="#associatedWithBusinessRule"/>
</owl:ObjectProperty>
<owl:ObjectProperty rdf:ID="roleReferencesPrivilege">
  <owl:inverseOf rdf:resource="#referencedByRole"/>
</owl:ObjectProperty>
<BC:EnterpriseBusinessStakeholders rdf:ID="Salesperson">
  <BC:StakeHolderName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Mark</BC:StakeHolde
rName>
  <BC:StakeholderConcern
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
    >Improve Client Retention</BC:StakeholderConcern>
  <BC:StakeHolderGoal
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Find
Clients</BC:StakeHolderGoal>
  <BC:StakeHolderGoalDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
    >To find clients needing Products and support and arrange contratcs with
them.</BC:StakeHolderGoalDescription>
  <BC:hasSolution rdf:resource="#StrategicSolutions1"/>
</BC:EnterpriseBusinessStakeholders>
<BC:Long-Term rdf:ID="ServiceCustomization">
  <BC:PotentialTechnology
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
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        >Personlaised interfaces.</BC:PotentialTechnology>
      <BC:KnowledgeRequiremnts
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Quicker ways to match services to client
needs.</BC:KnowledgeRequiremnts>
      <BC:TypeOfBenefits
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Increasing business with exsisting clients.</BC:TypeOfBenefits>
    </BC:Long-Term>
    <owl:DatatypeProperty rdf:ID="serviceDescription">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="serviceGrounding">
      <owl:inverseOf rdf:resource="#serviceGroundingReferencesService"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="serviceGroundingReferencesService">
      <owl:inverseOf rdf:resource="#serviceGrounding"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="serviceModel">
      <owl:inverseOf rdf:resource="#serviceModelReferencesService"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="serviceModelReferencesService">
      <owl:inverseOf rdf:resource="#serviceModel"/>
    </owl:ObjectProperty>
    <owl:DatatypeProperty rdf:ID="serviceName">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:ObjectProperty rdf:ID="serviceProfile">
      <owl:inverseOf rdf:resource="#serviceProfileReferencesService"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="serviceProfileReferencesService">
      <owl:inverseOf rdf:resource="#serviceProfile"/>
    </owl:ObjectProperty>
    <owl:Class rdf:ID="Short-Term">
      <rdfs:subClassOf rdf:resource="#EnterpriseBusinessObjective"/>
    </owl:Class>
    <owl:Class rdf:ID="Short-Term-Plan">
      <rdfs:subClassOf rdf:resource="#EnterpriseBusinessPlan"/>
    </owl:Class>
    <BC:Short-Term-Plan rdf:ID="Short-Term-Plan1">
      <BC:BusinessPlanName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string">ProductPromo1</BC:
BusinessPlanName>
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        <BC:BusinessPlanDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
          >Product promotion and Marketing Business Plan for better customer
satisfaction and Increased Sales Contratcs.</BC:BusinessPlanDescription>
        <BC:hasdescription rdf:resource="#NonExecutedSpecification1"/>
      </BC:Short-Term-Plan>
      <owl:Class rdf:ID="Simple">
        <rdfs:subClassOf rdf:resource="#EnterpriseActivity"/>
      </owl:Class>
      <owl:DatatypeProperty rdf:ID="specificationLocation">
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#anyURI"/>
      </owl:DatatypeProperty>
      <owl:DatatypeProperty rdf:ID="StakeholderConcern">
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
        <rdfs:domain rdf:resource="#EnterpriseBusinessStakeholders"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
      </owl:DatatypeProperty>
      <owl:DatatypeProperty rdf:ID="StakeholderDescription">
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
        <rdfs:domain rdf:resource="#EnterpriseBusinessStakeholders"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
      </owl:DatatypeProperty>
      <owl:DatatypeProperty rdf:ID="StakeHolderGoal">
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
        <rdfs:domain rdf:resource="#EnterpriseBusinessStakeholders"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
      </owl:DatatypeProperty>
      <owl:DatatypeProperty rdf:ID="StakeHolderGoalDescription">
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
        <rdfs:domain rdf:resource="#EnterpriseBusinessStakeholders"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
      </owl:DatatypeProperty>
      <owl:DatatypeProperty rdf:ID="StakeHolderName">
        <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
        <rdfs:domain rdf:resource="#EnterpriseBusinessStakeholders"/>
        <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
      </owl:DatatypeProperty>
      <owl:ObjectProperty rdf:ID="stakeholderOfBusinessArea">
        <rdf:type
rdf:resource="http://www.w3.org/2002/07/owl#InverseFunctionalProperty"/>
        <rdfs:range rdf:resource="#EnterpriseBusinessArea"/>
        <owl:inverseOf rdf:resource="#businessAreaStakeholder"/>
      </owl:ObjectProperty>
      <owl:ObjectProperty rdf:ID="stakeholderOfBusinessDomain">
        <rdfs:range rdf:resource="#EnterpriseBusinessDomain"/>
      <owl:inverseOf rdf:resource="#businessDomainStakeholder"/>
    </owl:ObjectProperty>
    <owl:DatatypeProperty rdf:ID="StrategicSolutionDescription">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseStrategicSolutions"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="StrategicSolutionName">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#EnterpriseStrategicSolutions"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <BC:EnterpriseStrategicSolutions rdf:ID="StrategicSolutions1">
      <BC:StrategicSolutionName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >CustomerRelationshipManagement</BC:StrategicSolutionName>
      <BC:providesSolutionto rdf:resource="#Salesperson"/>
      <BC:meetsObjective
rdf:resource="#Improved_Response_to_Client_Requests"/>
      <BC:belongstoBusinessArea rdf:resource="#BusinessArea1"/>
    </BC:EnterpriseStrategicSolutions>
    <BC:EnterpriseStrategicSolutions rdf:ID="StrategicSolutions2">
      <BC:StrategicSolutionName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >ImproveSupplyChain</BC:StrategicSolutionName>
      <BC:providesSolutionto rdf:resource="#Manager"/>
    </BC:EnterpriseStrategicSolutions>
    <BC:EnterpriseStrategicSolutions rdf:ID="StrategicSolutions3">
      <BC:StrategicSolutionName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Emphasise on eProcurement</BC:StrategicSolutionName>
      <BC:providesSolutionto rdf:resource="#Consultant"/>
      <BC:belongstoBusinessArea rdf:resource="#BusinessArea3"/>
    </BC:EnterpriseStrategicSolutions>
    <BC:EnterpriseStrategicSolutions rdf:ID="StrategicSolutions4">
      <BC:StrategicSolutionName
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >CustomerRelationshipManagement</BC:StrategicSolutionName>
      <BC:belongstoBusinessArea rdf:resource="#BusinessArea1"/>
    </BC:EnterpriseStrategicSolutions>
    <owl:Class rdf:ID="Street">
      <rdfs:subClassOf rdf:resource="#EnterpriseLocation"/>
    </owl:Class>
    <BC:Street rdf:ID="Street1">
      <BC:locationDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
```

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        >Corporate Headquarters</BC:locationDescription>
      <BC:StreetAddress
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >101,17A West 230 North.</BC:StreetAddress>
    </BC:Street>
    <BC:Street rdf:ID="Street2">
      <BC:locationDescription
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >Offshore Office Location</BC:locationDescription>
      <BC:StreetAddress
rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >201,140/3 NDA Road.</BC:StreetAddress>
    </BC:Street>
    <owl:DatatypeProperty rdf:ID="StreetAddress">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:domain rdf:resource="#Street"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
    </owl:DatatypeProperty>
    <owl:Class rdf:ID="Sub-Activity">
      <rdfs:subClassOf rdf:resource="#Complex"/>
    </owl:Class>
    <owl:ObjectProperty rdf:ID="supportedByCollaborationProcess">
      <rdfs:domain rdf:resource="#EnterpriseBusinessGoal"/>
    </owl:ObjectProperty>
    <owl:ObjectProperty rdf:ID="supportedByPrivateProcess">
      <rdfs:domain rdf:resource="#EnterpriseBusinessGoal"/>
    </owl:ObjectProperty>
    <owl:Class rdf:ID="SystemCapabilitiesContext">
      <rdfs:subClassOf rdf:resource="#EnterpriseBusinessContext"/>
      <owl:disjointWith rdf:resource="#BusinessProcessContext"/>
      <rdfs:comment rdf:datatype="http://www.w3.org/2001/XMLSchema#string"
        >When a particular semantic or structure is primarily the result of system
constraints or compliance with a standard, it is attributable to the System Capabilities
Context.</rdfs:comment>
    </owl:Class>
    <owl:DatatypeProperty rdf:ID="taskCreationTimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="taskDeletionTimestamp">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
    </owl:DatatypeProperty>
    <owl:DatatypeProperty rdf:ID="taskDescription">
      <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
      <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
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```
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="taskModificationTimestamp">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#dateTime"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="taskName">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="toperformanAcitivity">
    <rdfs:range rdf:resource="#EnterpriseActivity"/>
  </owl:ObjectProperty>
  <owl:DatatypeProperty rdf:ID="TotalRevenue">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessPerformance"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#float"/>
  </owl:DatatypeProperty>
  <owl:DatatypeProperty rdf:ID="TypeOfBenefits">
    <rdf:type rdf:resource="http://www.w3.org/2002/07/owl#FunctionalProperty"/>
    <rdfs:domain rdf:resource="#EnterpriseBusinessObjective"/>
    <rdfs:range rdf:resource="http://www.w3.org/2001/XMLSchema#string"/>
  </owl:DatatypeProperty>
  <owl:ObjectProperty rdf:ID="workgroupIncludesPerson">
    <owl:inverseOf rdf:resource="#assignedToWorkgroup"/>
  </owl:ObjectProperty>
  <owl:ObjectProperty rdf:ID="worksForDepartment"/>
  <owl:ObjectProperty
rdf:about="http://protege.stanford.edu/plugins/owl/protege#STARTUP-
EXPRESSION"/>
  <owl:ObjectProperty
rdf:about="http://protege.stanford.edu/plugins/owl/protege#STARTUP-FILE"/>
  <rdf:Description rdf:about="http://www.w3.org/2003/11/swrl#AtomList"/>
  <rdf:Description rdf:about="http://www.w3.org/2003/11/swrl#Builtin"/>
  <rdf:Description rdf:about="http://www.w3.org/2003/11/swrl#BuiltinAtom"/>
  <rdf:Description rdf:about="http://www.w3.org/2003/11/swrl#ClassAtom"/>
  <rdf:Description rdf:about="http://www.w3.org/2003/11/swrl#DataRangeAtom"/>
  <rdf:Description
rdf:about="http://www.w3.org/2003/11/swrl#DatavaluedPropertyAtom"/>
  <rdf:Description
rdf:about="http://www.w3.org/2003/11/swrl#DifferentIndividualsAtom"/>
  <rdf:Description rdf:about="http://www.w3.org/2003/11/swrl#Imp"/>
  <rdf:Description
rdf:about="http://www.w3.org/2003/11/swrl#IndividualPropertyAtom"/>
  <rdf:Description
rdf:about="http://www.w3.org/2003/11/swrl#SameIndividualAtom"/>
</rdf:RDF>
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